SIEMENS



Application Manual

SIVACON S4

Power distribution boards up to 6300 A

Edition 03/2025

https://www.siemens.de/lowvoltage/technical-support

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SIVACON

Switchboards
SIVACON S4 power distribution board

Application Manual

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03/2025
8PQ9803-1AA61/02

Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠ DANGER

indicates that death or severe personal injury **will** result if proper precautions are not taken.

⚠ WARNING

indicates that death or severe personal injury **may** result if proper precautions are not taken.

⚠ CAUTION

indicates that minor personal injury can result if proper precautions are not taken.

NOTICE

indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

⚠ WARNING

Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

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Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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Ⓟ 04/2025 Subject to change

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General

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1.1 Change documentation

Release number	Changes
03/2025	- Technical specifications 800 V (1.14) - Aluminum busbar added (3.8) - Power supply systems (3.3) - Busbar arrangement (3.7) - Rated diversity factors (3.15) - Screw connections (4.6) - Editorial adjustments

1.2 Danger notices

DE		GEFAHR	**Gefährliche Spannung. Lebensgefahr oder schwere Verletzungsgefahr.** Vor Beginn der Arbeiten Anlage und Gerät spannungsfrei schalten. Die Installations- und Wartungsarbeiten an diesem Gerät dürfen nur von einer autorisierten Elektrofachkraft ausgeführt werden.
EN		DANGER	**Hazardous voltage. Will cause death or serious injury.** Turn off and lock out all power supplying this device before working on this device. Installation and maintenance work on this device may only be carried out by an authorized electrician.
FR		DANGER	**Tension électrique. Danger de mort ou risque de blessures graves.** Mettre hors tension avant d'intervenir sur l'appareil. Les travaux d'installation et d'entretien de cet appareil doivent uniquement être réalisés par une personne qualifiée en électricité.
ES		PELIGRO	**Tensión peligrosa. Puede causar la muerte o lesiones graves.** Desconectar la alimentación eléctrica antes de trabajar en el equipo. Las tareas de instalación y mantenimiento de este equipo solo puede llevarlas a cabo un un electricista autorizado.
IT		PERICOLO	**Tensione pericolosa. Può provocare morte o lesioni gravi.** Scollegare l'alimentazione prima di eseguire interventi sull'apparecchiatura. L'installazione e la manutenzione di questo apparecchio devono essere effettuati solo da un elettrotecnico autorizzato.
PT		PERIGO	**Tensão perigosa. Perigo de morte ou ferimentos graves.** Desligue a alimentação elétrica e proteja contra o religamento, antes de iniciar o trabalho no equipamento. Os trabalhos de instalação e manutenção neste equipamento somente podem ser realizados for eletricistas autorizados.
TR		TEHLİKE	**Tehlikeli gerilim. Ölüm tehlikesi veya ağır yaralanma tehlikesi.** Çalışmalara başlamadan önce, sistemin ve cihazın gerilim beslemesini kapatınız. Bu cihazın montajı ve bakımı yalnız yetkili bir elektrik teknisyeni tarafından yapılmalıdır.
РУ		ОПАСНО	**Опасное напряжение. Опасность для жизни или возможность тяжелых травм.** Перед началом работ отключить подачу питания к установке и к устройству. Работы по монтажу и техническому обслуживанию данного устройства должны производиться уполномоченным специалистом по электротехнике.
PL		ZAGROŻE-NIE	**Niebezpieczne napięcie. Niebezpieczeństwo poważnych obrażeń lub utraty życia.** Przed rozpoczęciem prac wyłączyć zasilanie instalacji i urządzenia energią elektryczną. Prace instalacyjne i konserwacyjne na tym urządzeniu może przeprowadzać wyłącznie posiadający odpowiednie kwalifikacje elektryk.
中文		危险	**危险电压。可能导致生命危险或重伤危险。** 操作设备时必须确保切断电源。该设备的安装和维护工作仅能由具备专业资格的 电工完成。

DA	   	FARE	**Farlig spænding. Livsfare eller risiko for slemme kvæstelser.** Inden arbejdet påbegyndes skal anlægget og enheden gøres spændingsfri. Installationer og vedligeholdelser på dette apparat må kun gennemføres af en autoriseret elektriker.
FI		VAARA	**Vaarallinen jännite. Vakava loukkaantumisvaara tai hengenvaara.** Laite ja laitteisto on kytkettävä jännitteettömiksi ennen töiden aloittamista. Tämän laitteen asennus-ja huoltotöitä saa suorittaa ainoastaan valtuutettu sähköteknikko.
ET		OHT	**Ohtlik pinge. Oht elule või raskete vigastuste oht.** Enne tööde algust tuleb süsteemi ja seadme pinge välja lülitada. Seadme paigaldus- ja hooldustöid võib teha ainult atesteeritud elektrik.
BG		ОПАСНОСТ	**Опасно напрежение. Опасност за живота или опасност от тежки телесни повреди.** Преди започване на работа изключете захранването на инсталацията или устройството. Монтажът и техническото обслужване на това устройство се извършват единствено от оторизиран електротехник.
HR		OPASNOST	**Opasni napon. Opasnost po život ili opasnost od teških ozljeda.** Prije početka radova postrojenje i uređaj spojiti bez napona. Radove instalacije i održavanja na uređaju smije izvoditi samo ovlašteno stručno elektrotehničko osoblje.
EL		ΚΙΝΔΥΝΟΣ	**Επικίνδυνη τάση. Κίνδυνος για τη ζωή ή σοβαρού τραυματισμού.** Πριν από την έναρξη των εργασιών απομονώνετε την εγκατάσταση και τη συσκευή από την παροχή τάσης. Οι εργασίες εγκατάστασης και συντήρησης αυτής της συσκευής πρέπει να πραγματοποιούνται μόνο από εξουσιοδοτημένο ηλεκτρολόγο.
GA		CONTÚIRT	**Voltas contúirteach. Baol go bhfaighfear bás nó tromghortú.** Múch agus dícheangail gach foinse cumhachta a sholáthraíonn an gaireas seo sula ndéanfar obair air. Is ag leictreoir údaraithe amháin atá cead an gléas a shuiteáil agus obair chothabhála a dhéanamh air.
LV		BĪSTAMI	**Bīstams spriegums. Letālu seku vai smagu traumu risku.** Pirms uzsākt darbu, atslēdziet iekārtu un ierīci no barošanas. Šīs ierīces uzstādīšanu un tehniskās apkopes darbus drīkst veikt vienīgi pilnvarots elektriķis.
LT		PAVOJUS	**Pavojinga įtampa. Pavojus gyvybei arba sunkaus susižalojimo pavojus.** Prieš darbų pradžią atjunkite sistemos ir prietaiso įtampą. Šio įrenginio įrengimo ir techninės priežiūros darbus leidžiama atlikti tik įgaliotam elektrikui.
MT		PERIKLU	**Vultaġġ perikoluż. Riskju ta' mewt jew korriment serju.** Itfi u sakkar il-provvista kollha tad-dawl li tkun qed tforni d-dawl lil dan it-tagħmir qabel ma taħdem fuq dan it-tagħmir. Ix-xogħlijiet ta' installazzjoni u manutenzjoni fuq dan it-tagħmir jistgħu jitwettqu biss minn elettriċista awtorizzat.
NL		GEVAAR	**Gevaarlijke spanning. Levensgevaar of gevaar voor ernstig letsel.** Schakel vóór aanvang van de werkzaamheden installatie en apparaat spanningsvrij. De installatie- en onderhoudswerken aan dit toestel mogen enkel door een geautorisseerde elektricien uitgevoerd worden.
RO		PERICOL	**Tensiune periculoasă. Pericol de moarte sau de accidentări grave.** Înaintea începerii lucrărilor, deconectaţi instalaţia şi aparatul de la tensiune. Lucrările de instalare şi întreţinere pentru acest dispozitiv pot fi efectuate doar de către un electrician autorizat.
SV		FARA	**Farlig spänning. Livsfara eller risk för allvarliga personskador.** Koppla anläggningen och apparaten spänningsfri innan du påbörjar arbetena. Installation och underhåll av denna apparat får endast utföras av en behörig elektriker.
SK		NEBEZ-PEČENSTVO	**Nebezpečné napätie. Nebezpečenstvo ohrozenia života alebo vzniku ťažkých zranení.** Pred začatím prác zariadenie a prístroj odpojte od napätia. Inštalačné a údržbárske práce na tomto prístroji môže vykonávať výlučne autorizovaný elektrikár.
SL		NEVARN-OST	**Nevarna napetost. Nevarnost za življenje ali nevarnost hudih poškodb.** Pred začetkom dela je treba pri napravi in aparatu odklopiti napajanje. Inštalacijska in vzdrževalna dela na tej napravi sme izvesti samo pooblaščen električar.“
CS		NEBEZPEČÍ	**Nebezpečné napětí. Nebezpečí smrtelného nebo těžkého úrazu.** Před zahájením prací odpojte zařízení a modul od napětí. Instalační a údržbářské práce smí na tomto přístroji provádět pouze kvalifikovaný elektrikář.“
HU		VESZÉLY	**Veszélyes feszültség. Életveszély vagy súlyos sérülésveszély.** A munkák megkezdése előtt végezze el a berendezés vagy készülék feszültség-mentesítését. Ezen az eszközön a telepítéssel és a karbantartással kapcsolatos feladatokat kizárólag megfelelő felhatalmazással rendelkező villamossági szakember végezheti.

Technical Support:	Internet: http://www.siemens.com/lowvoltage/technical-support

1.3 Terms and definitions

IEC 61439 - Low-voltage switchgear and controlgear assemblies

U_n	**Rated voltage** The switchgear and controlgear assembly's manufacturer's specified maximum nominal voltage of the network for which the main circuits of the switchgear and controlgear assembly are designed.
U_e	**Rated operating voltage (of a circuit of a switchgear and controlgear assembly)** The switchgear and controlgear assembly manufacturer's specified voltage value for the switchgear and controlgear assembly or a circuit of a switchgear and controlgear assembly, effective value for alternating voltage or mean value for direct voltage, which, combined with the rated current, determines the usage.
U_i	**Rated insulation voltage** Withstand voltage (effective value) which is specified by the switchgear and controlgear assembly's manufacturer for the switchgear and controlgear assembly or a circuit of a switchgear and controlgear assembly and which specifies the defined (long-term) endurance of its insulation.
U_{imp}	**Rated impulse withstand voltage** Impulse withstand voltage value assigned by the manufacturer of the switchgear and controlgear assembly to a switchgear and controlgear assembly and circuit of a switchgear and controlgear assembly, which specifies the defined endurance of its insulation to transient overvoltages.
I_{rated}	**Rated current** The switchgear and controlgear assembly's manufacturer's specified value of the continuous current that can be carried without exceeding the specified temperature rise limits of the various parts of the switchgear and controlgear assembly under specified conditions.
I_{pk}	**Rated peak withstand current** The highest instantaneous value of short-circuit current specified by the manufacturer of the switchgear and controlgear assembly that can be withstood under defined conditions.
I_{cw}	**Rated short-time withstand current** The effective value of short-time alternating current or mean value of the short-time direct current specified by the manufacturer of the switchgear and controlgear assembly, given as current and time, which can be resisted under certain conditions.
I_{cc}	**Rated conditional short-circuit current** The value of prospective short-circuit current specified by the manufacturer of the switchgear and controlgear assembly which the circuit can withstand during the total break time of the short-circuit protective device under defined conditions.
I_{nA}	**Rated current of the switchgear and controlgear assembly** Rated current that can be distributed by a switchgear and controlgear assembly without exceeding the specified temperature rise limits of the various parts.
I_{nc}	**Rated current of a circuit** Rated current that a main circuit can carry when it is the only circuit in a cubicle of a switchgear and controlgear assembly that carries current.
RDF	**Rated diversity factor** Value calculated by dividing the rated operational current of the outgoing feeder-main circuit I_{ng} by the rated current I_{nc} of the same outgoing feeder main circuit, where I_{ng} and I_{nc} are determined from tests.
I_{ng}	**Rated operational current** Rated current that a main circuit can carry, taking into account the mutual thermal influences of the other circuits that are simultaneously loaded in the same cubicle of the switchgear and controlgear assembly.

1.4 Siemens Industry Online Support

Information and service

At Siemens Industry Online Support you can obtain up-to-date information from our global support database:

- Product support
- Application examples
- Forum
- mySupport

Link: Siemens Industry Online Support (https://support.industry.siemens.com/cs/de/en)

Product support

You can find information and comprehensive know-how covering all aspects of your product here:

- **FAQs**

  Answers to frequently asked questions
- **Manuals/operating instructions**

  Read online or download, available as PDF or individually configurable.
- **Certificates**

  Clearly sorted according to approving authority, type and country.
- **Characteristics**

  For support in planning and configuring your system.
- **Product announcements**

  The latest information and news concerning our products.
- **Downloads**

  Here you will find updates, service packs, HSPs and much more for your product.
- **Application examples**

  Function blocks, background and system descriptions, performance statements, demonstration systems, and application examples, clearly explained and represented.
- **Technical data**

  Technical product data for support in planning and implementing your project

Link: Product support (https://support.industry.siemens.com/cs/ww/en/ps)

mySupport

The following functions are available in your personal work area "mySupport":

- **Support Request**

  Search for request number, product or subject

- **My filters**

  With filters, you limit the content of the online support to different focal points.

- **My favorites**

  With favorites you bookmark articles and products that you need frequently.

- **My notifications**

  Your personal mailbox for exchanging information and managing your contacts. You can compile your own individual newsletter in the "Notifications" section.

- **My products**

  With product lists you can virtually map your control cabinet, your system or your entire automation project.

- **My documentation**

  Configure your individual documentation from different manuals.

- **CAx data**

  Easy access to CAx data, e.g. 3D models, 2D dimension drawings, EPLAN macros, device circuit diagrams

- **My IBase registrations**

  Register your Siemens products, systems and software.

1.5 Support Request

After you have registered, you can use the Support Request form in the online support to send your question directly to Technical Support:

Support Request:	Internet (https://www.siemens.com/support-request)

1.6 Siemens Industry Online Support app

Siemens Industry Online Support app

The Siemens Industry Online Support app provides you access to all the device-specific information available on the Siemens Industry Online Support portal for a particular article number, such as operating instructions, manuals, data sheets, FAQs etc.

The Siemens Industry Online Support app is available for Android and iOS:

Android

iOS

1.7 System overview

SIVACON S4 is a system for creating design-verified switchgear and controlgear assemblies in accordance with IEC 61439-1/2, which is used in the infrastructural power supply in administrative and utility buildings, in industrial and commercial buildings, as well as in public buildings, such as schools and shopping centers.



Figure 1-1 Front view of the SIVACON S4

The installation of the system, as well as its operation and maintenance, is intended exclusively for qualified electricians.

Features at a glance

- System for creating design-verified switchgear assemblies in accordance with IEC 61439-1/2
- High degree of flexibility and easy implementation
- Attractive design, innovative ventilation and locking system
- Copper drawings for own production
- Busbar systems up to I_N 6 300 A, I_{cw} 100 kA (1 s), I_p 220 kA
- Form of internal separation up to 4b
- 3D output on button press via SIMARIS configuration

Siemens power distribution systems

Distribution boards ALPHA 160, 400, 630, 1250	Power distribution boards SIVACON S4	Power distribution boards SIVACON S8
		

Areas of application and possible applications

Power distribution boards compared

	 SIVACON S4	 SIVACON S8
Rated current MBB I_n	630 – 6 300 A	1 250 – 7 000 A
Form of internal separation	4b	4b
Rated short-time withstand current	100 kA, 1 s	150 kA, 1 s
Installation	Single-front	Double-front
Cubicle heights	2 000 mm	2 000 mm 2 200 mm
System depths Main busbar top Main busbar rear	 400, 600, 800 mm 800, 1 000, 1 200 mm [NF]	 500, 800 mm 600 mm [DIN]
Arcing fault protection systems	No	Operator and plant protection

1.8 CAx data in the Siemens SiePortal

You can find CAx data for the product in the SiePortal.

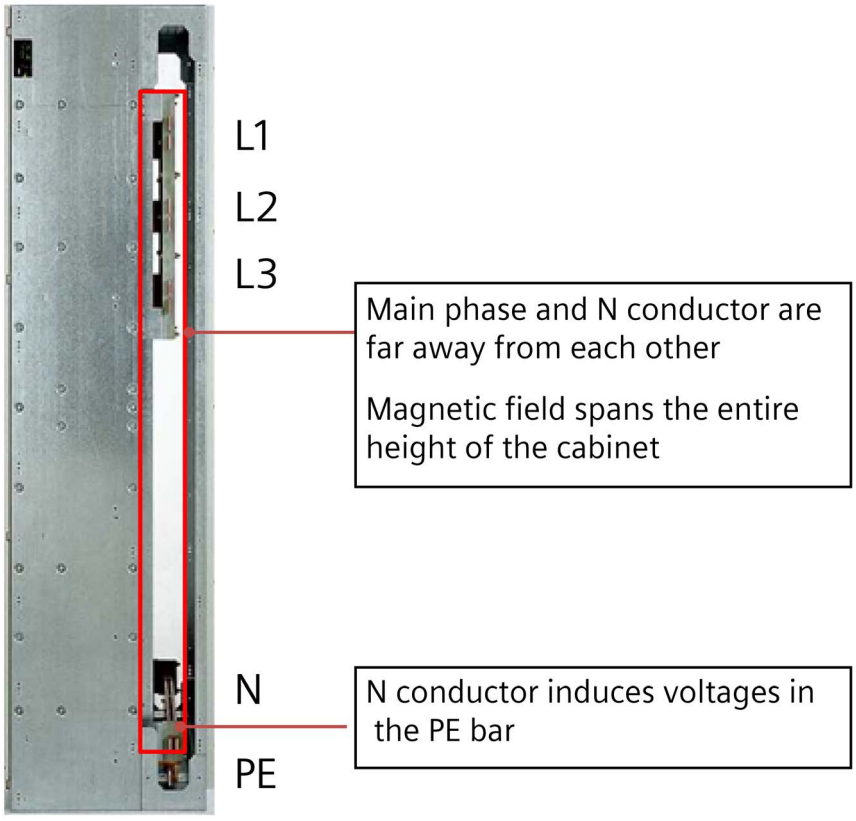
1. Enter the article number of the desired device in the "Products" field.
2. Click the "CAx data" link in the result.

See also

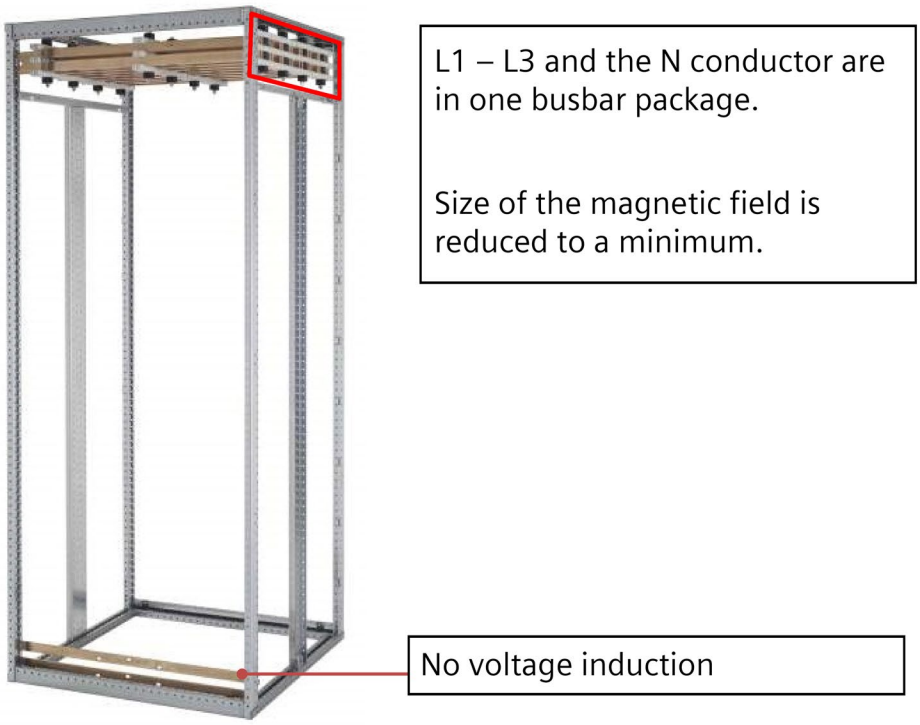
SIOS technical data - Getting started (https://support.industry.siemens.com/cs/ww/en/ps/)

1.9 EMC-compatible version

The following example shows an unfavorable change to busbar systems with high interference effect



An EMC-compatible busbar arrangement reduces interference effects to a minimum



Product-related information

EMC tests on SIVACON S4 were not performed and are not necessary as the requirements in accordance with IEC 61493-2 section J.9.4.2 a) and b) are complied with.

1.10 Recycling and disposal

For environmentally-friendly recycling and disposal of your old device, contact a company certified for the disposal of used electrical and electronic equipment, and dispose of the device as specified in the regulations for your particular country.

1.11 ESD Guidelines

ESD

All electronic devices are equipped with large-scale integrated ICs or components. Due to their design, these electronic elements are highly sensitive to overvoltage, and thus to any electrostatic discharge.

The acronym ESD has become the established designation for such electrostatic sensitive components/devices. This is also the international abbreviation for such devices.

ESD devices are identified by the following symbol:

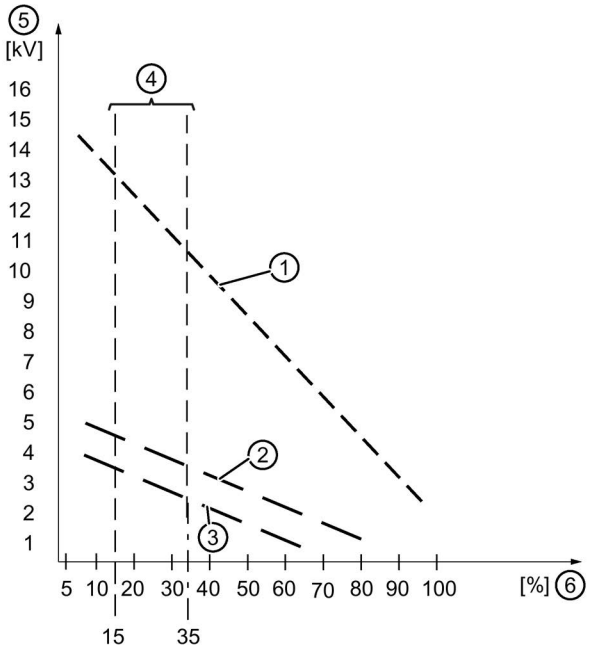


NOTICE
Electrostatic discharge ESD devices can be destroyed by voltages well below the threshold of human perception. These static voltages develop when you touch a component or electrical connection of a device without having drained the static charges present on your body. The damage caused to a device by overvoltage is usually not immediately evident and is only noticed after an extended period of operation.

Electrostatic charging

Anyone who is not connected to the electrical potential of their surroundings can be electrostatically charged.

The diagram below shows the maximum electrostatic voltage which may build up on a person coming into contact with the materials specified in the diagram. These values are in conformity with the specifications of IEC 61000-4-2.



① Synthetic material
② Wool
③ Antistatic material, e.g. wood or concrete
④ E.g. office spaces without humidity control (in winter)
⑤ Voltage
⑥ Relative humidity

Basic protective measures against electrostatic discharge

- Make sure the grounding is good:

  When handling electrostatic sensitive devices, ensure that your body, the workplace and packaging are grounded. In this way, you can avoid becoming electrostatically charged.

- Avoid direct contact:

  As a general rule, only touch electrostatic sensitive devices when this is unavoidable (e.g. during maintenance work). Handle the devices without touching any chip pins or PCB traces. In this way, the discharged energy cannot reach or damage sensitive devices.

  Discharge your body before taking any necessary measurements on a device. Do so by touching grounded metallic parts. Use only grounded measuring instruments.

1.12 Additional documentation

In addition to this manual, please also observe the following product documentation on the different individual topics.

Commissioning and maintenance

Document number	Contents
8PQ9801-5AA80	Operation and maintenance
8PQ9801-6AA65	Transportation and storage of switchboards
8PQ9801-6AA66	Installation and base mounting
8PQ9801-6AA67	Electrical and mechanical panel group

1.13 Certifications

General Declarations of Conformity

Document number	Contents
8PQ9801-7AA32	CE declaration acc. to IEC 61439
8PQ9801-7AA33	EAC certificate – Russia
8PQ9801-7AA34	CE Declaration of Conformity
8PQ9801-7AA35	ISO 9001 – Quality management system
8PQ9801-7AA72	Corrosion classes according to DIN EN ISO 12944-2:

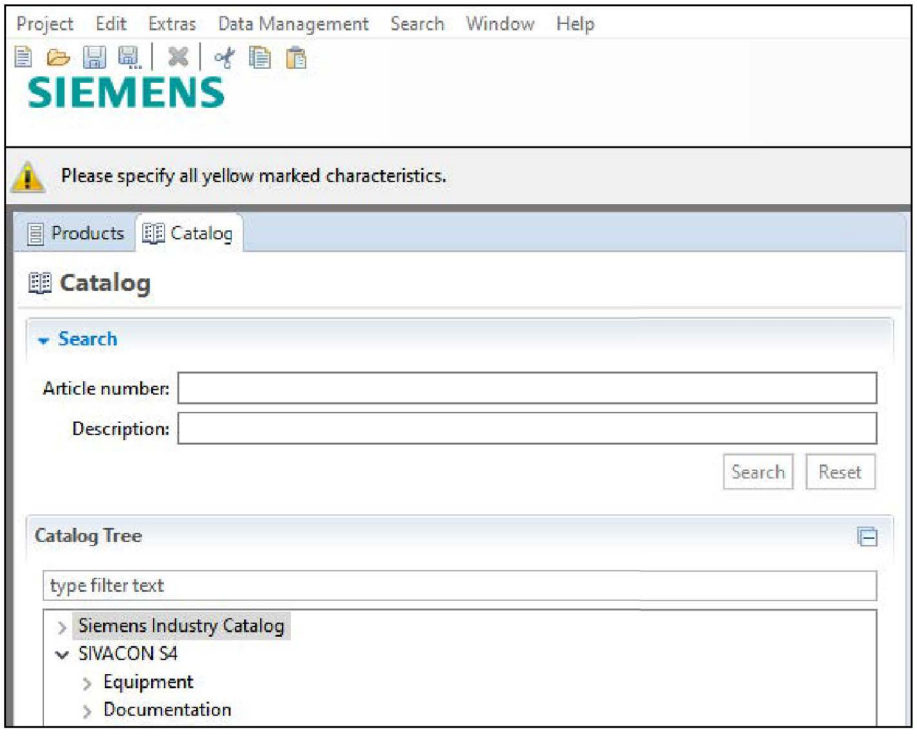
VDE approval

The proper performance of the design verification is independently verified and continuously updated by the VDE - Association of German Electrical Engineers. All approval documents are available to you to facilitate commissioning and electrical planning:

Document number	Contents
8PQ9801-8AA35	VDE mark approval
8PQ9801-8AA36	Cubicle versions
8PQ9801-8AA37	Technical data
8PQ9801-8AA41	Circuit breaker design 3WA – main busbar top
8PQ9801-8AA42	Circuit breaker design 3WA – main busbar bottom
8PQ9801-8AA43	Circuit breaker design 3WA – coupler
8PQ9801-8AA44	Outgoing feeder panel molded-case circuit breaker 3VA MCCB
8PQ9801-8AA45	Outgoing feeder panel molded-case circuit breaker 3VL MCCB
8PQ9801-8AA46	Outgoing feeder panel ACB 3WA
8PQ9801-8AA47	Outgoing feeder panel 3NP
8PQ9801-8AA48	Outgoing feeder panel 3NJ4
8PQ9801-8AA50	Verifications in accordance with IEC 61439-2
8PQ9801-8AA51	Test report
8PQ9802-8AA61	Main busbar system
8PQ9802-8AA62	Distribution busbar system
8PQ9802-8AA67	Outgoing feeder panel molded-case circuit breaker 3VM MCCB

Provision

All documents can be easily accessed via SIMARIS configuration.



1.14 Technical data

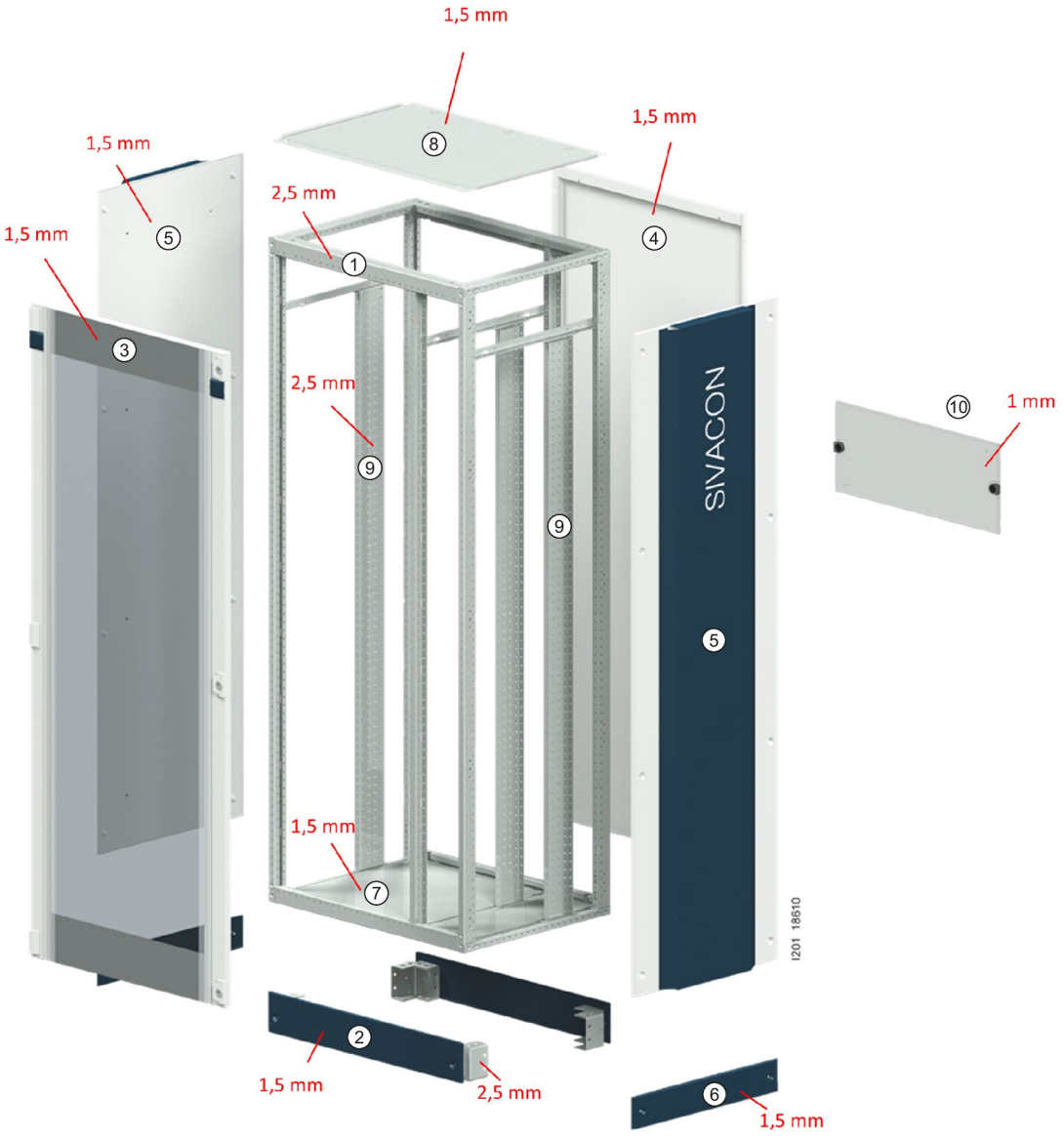
Technical data

Basic data

Installation conditions	Indoor installation	Ambient temperature in 24-hour average value Area of application	+35 °C -5 °C ... +40 °C
Rated operating voltage (U_e)	Main circuit Type of current		Up to 800 V (50 Hz) AC
Dimensioning Clearances and creepage distances	Rated impulse withstand voltage U_{imp} Rated insulation voltage U_i Pollution degree		Up to 12 kV 1 000 V 3
Busbars	Main busbar	Rated current Rated peak withstand current I_{pk} Rated short-time withstand current I_{cw}	Up to 6 300 A Up to 220 kA Up to 100 kA, 1 s
	Field busbar cascaded	Rated current Rated peak withstand current I_{pk} Rated short-time withstand current I_{cw}	Up to 1280 A Up to 65 kA Up to 143 kA, 1 s
	Field busbar non-cascaded	Rated current Rated peak withstand current I_{pk} Rated short-time withstand current I_{cw}	Up to 2810 A Up to 220 kA Up to 100 kA, 1 s
	Field busbar 3NJ6 In-line design, (plugged-in)	Rated current Rated peak withstand current I_{pk} Rated short-time withstand current I_{cw}	Up to 2100 A Up to 105 kA Up to 50 kA, 1 s
Internal separation	IEC 61439-2	No separation + Busbar systems Creation of compartments of the devices + Connections	Form 1 Form 2b Form 3b Form 4b

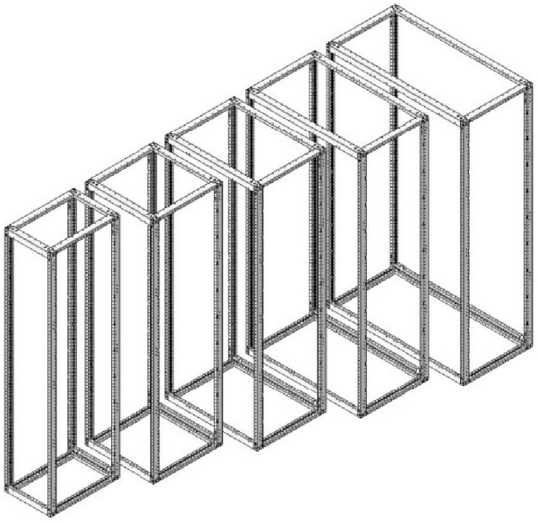
Surface treatment	Paint finish in accordance with DIN 43656		
	Supporting structure components	Sendzimir coated	
	Doors	Powder-coated	
	Side panels	Powder-coated	
	Rear panel IP55	Powder-coated	
	Rear panel IP40	Sendzimir coated	
	Top plates	Sendzimir coated	
	Standard color	RAL 7035 light gray	
	Design elements	Blue green basic See RAL 5020 ocean blue	
Degree of protection	Acc. to IEC 60529, EN 60529	Ventilated	IP30, IP40
		With top plate upgrade kit	IP31, IP41
		Non-ventilated	IP55
Protection class	Acc. to DIN EN 61140	Class I: Grounding	
Mechanical strength	Acc. to IEC 62262	Type of cover	IK08
		Top plate	IK09
		Door, rear panel, side panel	IK10
Dimensions	Preferred dimensions acc. to DIN 41488	Height of supporting structure	2.000 mm
		Depths of cubicles	400, 600, 800 mm 1 000, 1 200 mm
		Base (optional)	100, 200 mm

Material thicknesses



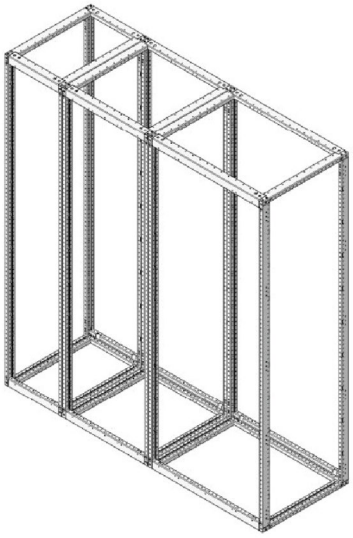
① Supporting structure
② Base
③ Cubicle and modular doors
④ Rear panel
⑤ Side panel
⑥ Base
⑦ Base plate
⑧ Top plate
⑨ Supporting structure
⑩ Covers

Dimensions of supporting structure

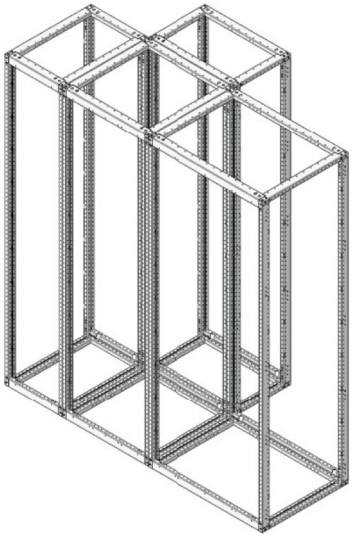


Widths [mm]	**Depths [mm]**
400 mm	400 mm
600 mm	600 mm
800 mm	800 mm
1 000 mm	
1 200 mm	

Alignment options



Lateral

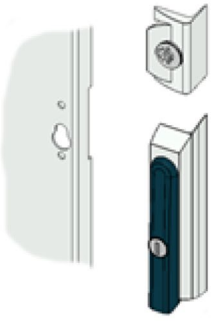


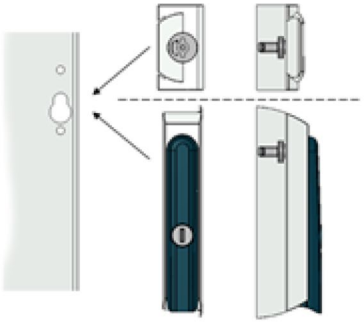
Rear

Door locks

Double-bit lock

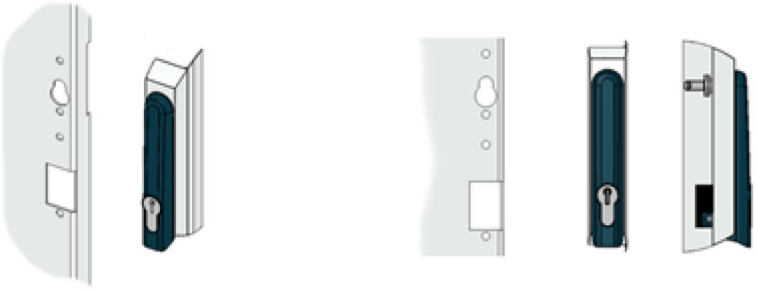
- Symmetrical design
- Stop position can be changed later





Semi-cylindrical profile

- Non symmetrical
- Fixed stop cannot be converted



Static loads on enclosure parts

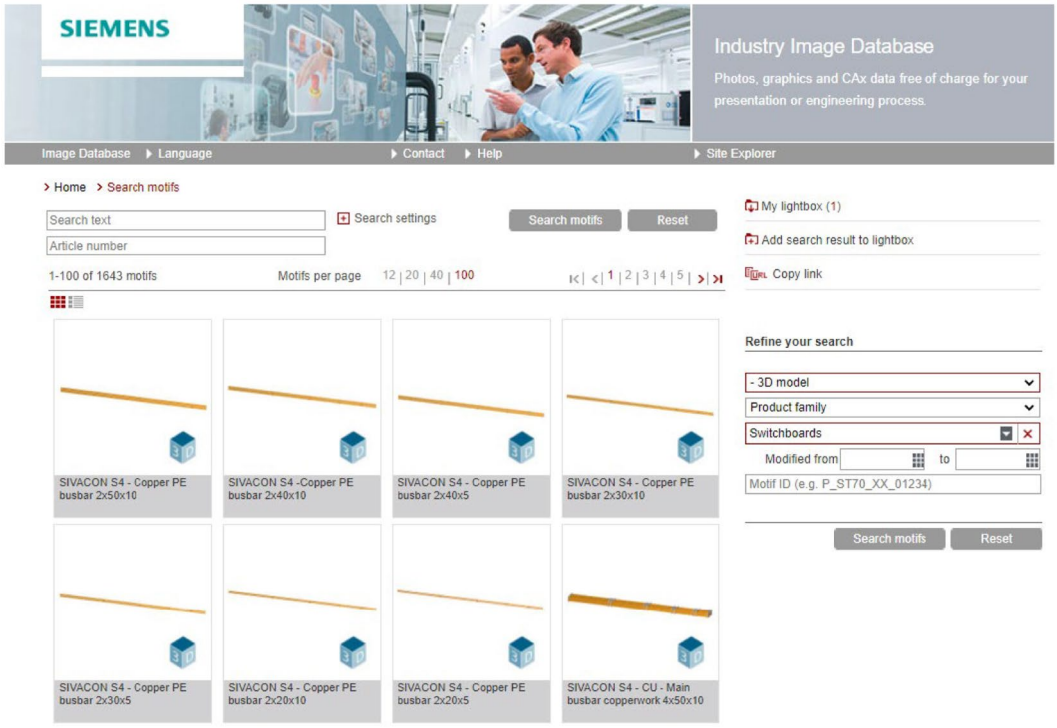
The following reference values serve as orientation for loads which are installed centrally on the respective components. Due to the numerous installation options, no guarantees can be given. In individual cases, please contact your contact person for an individual evaluation.

Functional unit		Variant		kg
Cover frame		Swivel-mounted		1.0
		Fixed mounting		5.0
Cover	Without hinge	Heights	50 –300 mm	0.5
		Heights	350 – 550 mm	1.0
		Heights	600 – 800 mm	2.0
Mounting plate field		Inner door		2.5
		Mounting plate		20.0
Cubicle door		Widths	400 –600 mm	10.0
		Widths	800 mm	5.0
		Widths	1 000 mm	2.5
Double door		Widths	1000 –1200 mm	2.5
Compartment door		Heights	150 –200 mm	0.5
		Heights	250 – 350 mm	1.5
		Heights	400 – 800 mm	3.0
Outer cover				10.0

1.15 CAD data provision

Detailed planning information is available for retrieval via the Siemens image database:

Siemens image database
(https://www.automation.siemens.com/bilddb/index.aspx?objecttype=60&usestructure=true&gridview=view1&currentpage=1&pagesize=12&showdetail=False&view=Search)

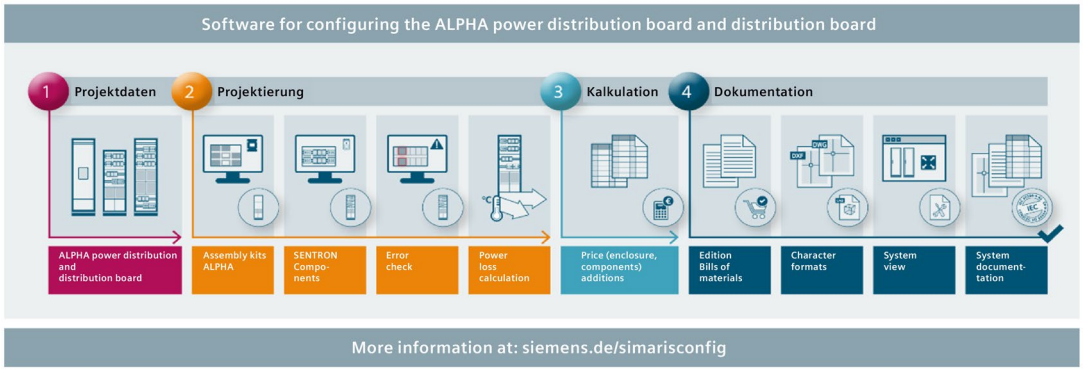


In addition to the installation mechanics, all 3D copper assemblies can be obtained in common formats:

- Step
- U3D

SIMARIS configuration

The free configuration software supports you in your entire process and workflow:



The planning and design of a low-voltage switchboard is very complex. Even with the support of the SIMARIS configuration software tool, the expertise of the user continues to be of great importance.

In order to enable the universal application of the tool, not all basic technical rules are represented in the software. The user is responsible for the correct technical planning and design of the switchboard.

Ambient conditions

2

2.1 Environmental conditions

Environmental conditions for switchboards

The external climate and the external environmental conditions (natural foreign substances, chemically active pollutants, small animals) have different effects on the switchboard. The effect depends on the climatic equipment of the switchboard room.

According to IEC 61439-1, the environmental conditions for low-voltage switchboards are classified in

- normal operating conditions (IEC 61439-1 section 7.1) and
- special operating conditions (IEC 61439-1 section 7.2).

SIVACON S4 low-voltage switchboards are intended for indoor use under the following operating conditions according to IEC 61493-1:

Environmental parameters	Lower limit	Upper limit	Measure
Ambient temperature	-5 °C	+ 40 °C + 35 °C (24-hour average value)	
Relative humidity	5 % [1)]	95 % [1)]	
Rate of temperature change	0.5 °C/min		
Height	Not defined	2 000 m	
Condensation	Yes - moderate condensation may occasionally occur due to temperature fluctuations (condensation)		Installation Control cabinet heating
Windblown precipitation	No		
Water (other than rain)	See special operating conditions		
Formation of ice	No		

[1)] in accordance with IEC 61439-1:2020

Other environmental parameters with their limit values based on IEC 60721-3-3:1994, 3K4	
Low absolute humidity High absolute humidity	1 g/m^2 [2)] 29 g/m^2 [2)]
Low air pressure High air pressure	70 kPA 106 kPA
Sunlight	700 W/m^2
Thermal radiation	None

In the event of a deviating classification of ambient conditions, these must already be evaluated before the offer is submitted.

Higher values are only permissible on request.

Conditions during transport, storage and installation

If the conditions during transport, storage and installation, e.g., the values for temperature or humidity, deviate from the values specified in the chapter "Normal operating conditions", the necessary measures must be agreed between the manufacturer of the switchboard and the user.

Refer to the operating instructions: Transportation and storage of switchboards 8PQ9801-6AA65

2.2 Installation altitudes

In principle, the equipment is designed for an installation altitude of up to 2 000 m above sea level.

NOTICE
For switchboards and equipment to be used at higher altitudes, it is necessary to take into account a reduction in the insulation strength, the switching capacity of the equipment and the cooling effect of the ambient air.

The switching capacity and current-carrying capacity of the equipment must be confirmed by the equipment manufacturer.

Altitude of the place of installation	**Derating factor for load**
Up to 2 000 m	1
Up to 2 500 m	0.93
Up to 3 000 m	0.88
Up to 3 500 m	0.83
Up to 4 000 m	0.79
Up to 4 500 m	0.76
Up to 5 000 m	0.70

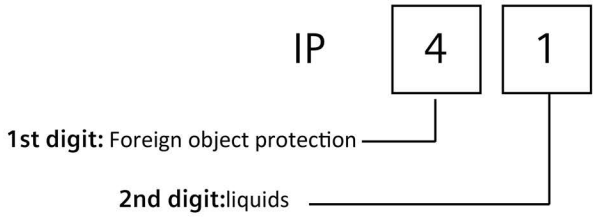
For more information on installation and floor mounting, please refer to the operating instructions "Installation and base mounting 8PQ9801-6AA66".

Basics

3

3.1 IP degree of protection

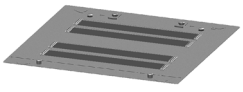
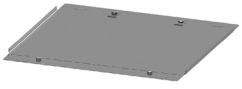
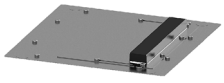
Acc. to IEC 60528



Code		Foreign objects
1		50 mm
2		12 mm
3		2.5 mm
4		1.0 mm
5		Wire protection, dust-protected
6		Wire protection, dust-tight

Code	Protection against ingress of water	
1	Falling dripping water	
2	Protection against direct sprays of water (up to 15°) from the vertical	
3	Protection against direct sprays of water	
4	Protection against water sprayed from all directions	
5	Protection against water jets	
6	Protection against powerful water jets	

The following types of protection can be realized with SIVACON S4:

IP 40	IP x1	IP 55	IP 40
 Ventilated	 Top plate upgrade kit	 Non-ventilated	 Cable entry

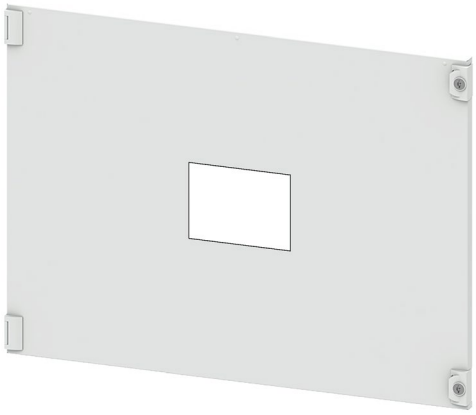
Reduced to IP30

- 3NJ4 in-line fuse switch disconnectors with external operation
- Outgoing feeder cubicles with supporting structure veneer without door

Cutouts and door mounting components



When installing pushbuttons, indicator lights, measuring devices, etc., make sure that the degree of protection of the device used corresponds at least to that of the switchgear and controlgear assembly. If it is smaller, the degree of protection of the overall system is reduced.



At the cutting edges, corrosion protection must be restored by using a suitable paint system (e.g., BRILLUX).

3.2 Form of internal separation

Form of internal separation according to IEC 61439-2

The form of internal separation and higher degrees of protection must be agreed between the manufacturer of the switchgear and controlgear assembly and the user.

Power switchgear and controlgear assemblies may be subdivided to achieve one or more of the following conditions between functional units, separate compartments, or by enclosure:

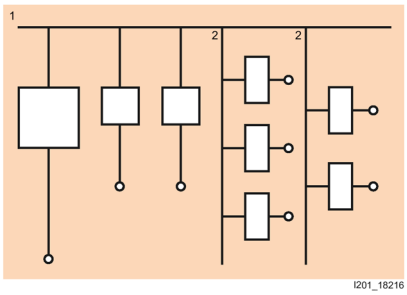
- Protection against touching dangerous parts. The degree of protection must be at least IPXXB;
- Protection against ingress of solid foreign objects. The degree of protection must be at least IP2X.

COMMENT: IP2X degree of protection also covers IPXXB degree of protection.

Separation may be provided using partitions or protective covers (made from metal or non-metal), insulation of exposed conductive parts, or integrated enclosure of equipment.

Within SIVACON S4 the following forms of internal separation are offered:

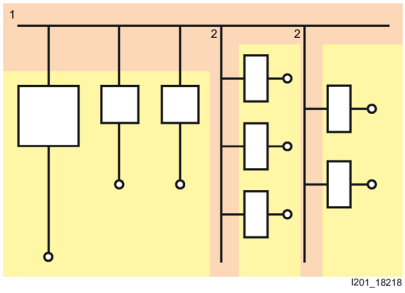
Form 1

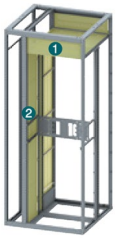




Outgoing feeder cubicle
Without internal separation

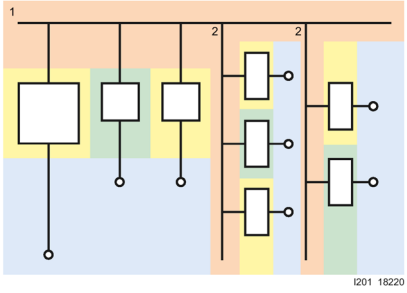
Form 2b

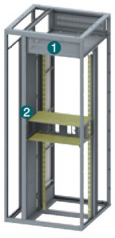




Outgoing feeder cubicle
+ separation of main busbar and field busbar

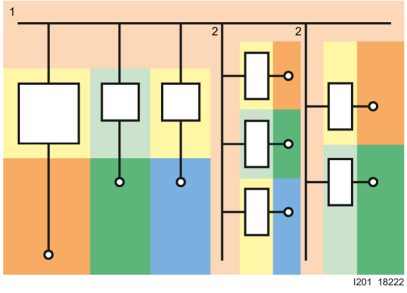
Form 3b

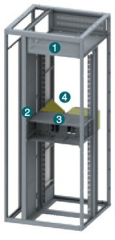




Outgoing feeder cubicle
- Separation of main busbar and field busbar
+ separation of main busbar and device compartments

Form 4b



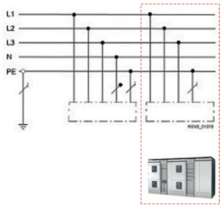
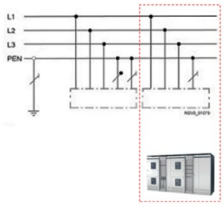
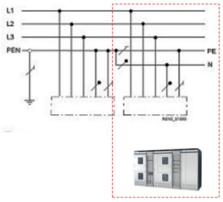


Outgoing feeder cubicle
- Separation of main busbar and field busbar
- Separation of device compartments
+ separation of connection points

Functional units
Connection point
① Main busbars
② Field busbar

3.3 Power supply systems

The design of the busbar system is determined by the line system configuration.

			
Line supply	TN-S	TN-C	TN-C-S
Description	Neutral and protective conductor separate	Neutral and protective conductor combined	Neutral and protective conductor combined separately
Busbar	L1-L3, PE, N	L1-L3, PEN	L1-L3, PEN (insulated); PE

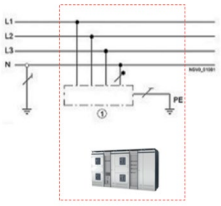
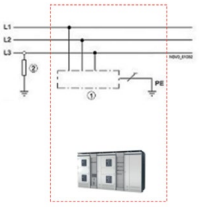
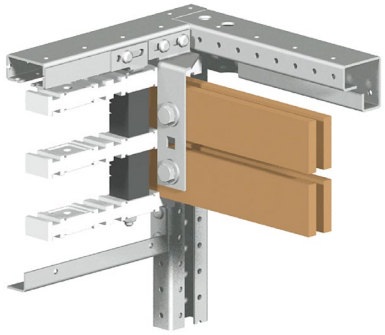
		
Line supply	TT	IT
Description	Neutral and directly grounded protective conductor	Directly grounded protective conductor
Busbar	L1-L3, PE, N	L1-L3, PE

Table 3- 1 Abbreviations

T	**T**erre	Ground
N	**N**eutre	Neutral conductor
C	**C**ombiné	Combined
S	**S**eparé	Separate

TN-C system supporting structure grounding



3.4 Standard transformers

Values according to EN 60909 and VDE 0102

S_{rated}	U	400 V, 50 Hz		415 V, 50 Hz		690 V, 50 Hz	
		I_{rated}	I_{sc}	I_{rated}	I_k	I_{rated}	I_k
kVA	**%**	**A**	**kA**	**A**	**kA**	**A**	**kA**
63	4	91	2.5	88	2.4	53	1.4
100	4	144	3.9	139	3.7	84	2.3
125	4	180	4.9	174	4.7	105	2.8
160	4	231	6.2	223	6.0	134	3.6
200	4	289	7.8	278	7.5	167	4.5
250	4	361	9.7	348	9.4	209	5.6
315	4	455	12.3	438	11.8	264	5.6
400	4	577	15.6	556	15.0	335	9.0
500	4	722	19.4	696	18.7	418	11.3
630	6	909	16.5	876	15.9	527	9.6
800	6	1155	21.0	1113	20.2	669	12.2
1 000	6	1443	26.2	1391	25.3	837	15.2
1 250	6	1804	32.8	1739	31.6	1046	19.0
1 600	6	2309	42.0	2226	40.5	1339	24.3
2 000	6	2887	52.5	2782	50.6	1673	30.4
2500	6	3608	65.6	3478	63.2	2092	30.4
3150	6	4550	82.7	3470	63.0	2640	47.7

S_{rated} Apparent power
I_{rated} Rated current
I_{sc} Initial symmetrical short-circuit current

3.5 Rated frequency 60 Hz

According to IEC 61439-1, 10.10.2.3.1, a derating of 5% results from a rated current of 800 A and higher when switching from 50 Hz to 60 Hz

NOTICE
Only the rated frequency of 50 Hz is supported in the software tool.

3.6 Short-circuit current-carrying capacity of the distribution busbars und functional units

A reduction of the short-circuit strength of the feeders with respect to the main busbars is permissible in accordance with IEC 61439-1, section 8.6.1:

8.6 Circuits and connections within switchgear and controlgear assemblies

8.6.1 Main circuits

...

Within a cubicle, the conductors (including the distribution busbars) between the main busbars and the infeed side of functional units, including the components of such units, may be rated for the reduced short-circuit stress that occurs on the output side of the short-circuit protection device of such unit, provided that such connections are so arranged that, under normal operating conditions, neither a short-circuit between line conductors and/or between phase conductors and protective conductors is to be expected.

Note

The above determination results from the fact that the distribution busbars, connecting bars and other feed lines to functional units branching off the main busbar are usually rated for much smaller currents than the main busbar. With small cross-sections which are sufficient from a heating point of view for the small feeder currents, it makes no sense to aim for the same dynamic and thermal short-circuit strength as for the main busbar.

Example

If a prospective short-circuit current of 100 kA is to be expected and a 3VA circuit-breaker is to be used, it must of course have a switching capacity of 100 kA, but will only let through a current with a peak value of approx. 50 kA, which corresponds to an effective value of only approx. 35 kA. Only this reduced current then stresses all conductors of the circuit for the very short switch-off time of the switch.

Summary

The dimensions of busbar systems must be designed to support correct operation and for errors. With regard to short-circuit strength, errors are considered outside the low-voltage switchgear and controlgear assembly.

The dimensions of busbar systems which are not protected by a current-limiting short-circuit protective device must reflect the rated short-time current phase current I_{CW} (1 s).

Busbar systems and conductors, which are designed in accordance with IEC 61439-1, 7.5.5.3 and protected by a current-limiting short-circuit protective device, may be rated for the short-circuit stress which is reduced by the inclusion of this device (details of the rated conditional short-time current I_{cc}).

3.7 Main busbar system

Equipment

The SIVACON S4 main busbar system offers a practical way of cascading rated currents, harmonized with the rated currents of standard transformers.

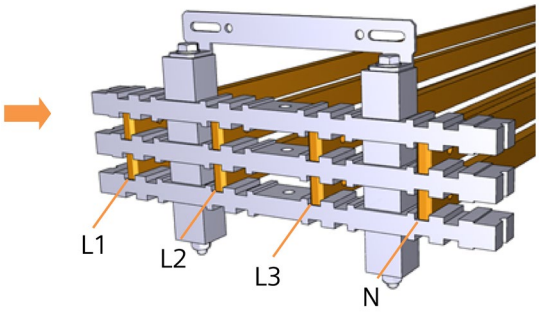
The basis for this is the universal busbar support for using rectangular sections.

Distribution and connecting busbars can be assembled without creating holes by using two, four or eight sub-conductors per phase.

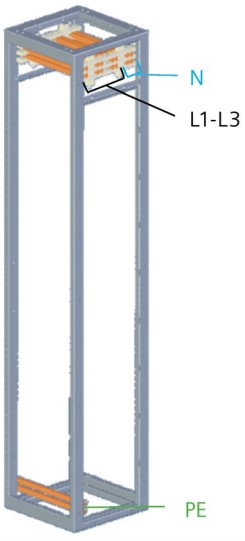
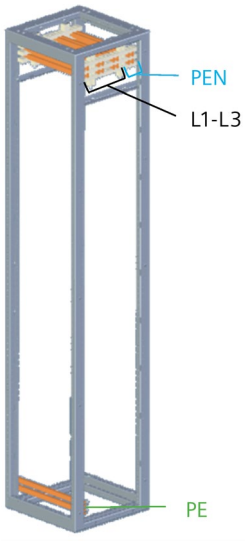


Busbar arrangement

Arrangement of the phases in the system



Busbar arrangement

L1-L3, N, PE	L1-L3, PEN (insulated); PE	L1-L3, PE	L1-L3, PEN
			

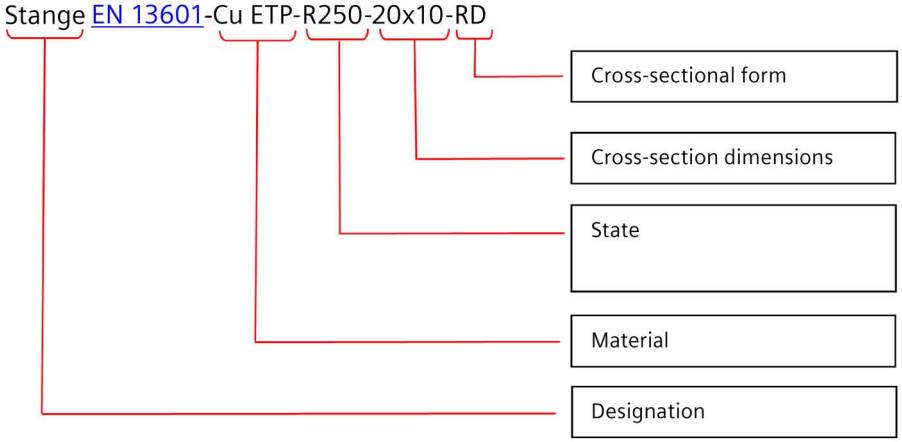
Surface treatment of copper busbars

Copper busbars should only be touched with cotton gloves in order to avoid marks.

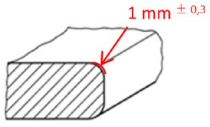
Wipe copper, silver-plated or tin-coated contact surfaces with a soft clean cloth.

If copper-contact marks appear, brush them to a distance of approx. 10 mm on either side using orbital grinders.

Raw material quality



Technical properties

Designation	**Rod**	
Material	Cu ETP	
State	R250 Tensile strength Yield strength	 Rm = 250 N / mm² Rp0.2 = 200 N / mm²
Cross-section dimensions	20 x 10 mm 30 x 10 mm 40 x 10 mm 50 x 10 mm	
Cross-sectional form	RD Rounded edges 	

Main busbar cross-sections

	Cross-section [mm]	Type
	20 x 10	EN 13601-Cu ETP-R250-**20x10**-RD
	30 x 10	EN 13601-Cu ETP-R250-**30x10**-RD
	40 x 10	EN 13601-Cu ETP-R250-**40x10**-RD
	50 x 10	EN 13601-Cu ETP-R250-**50x10**-RD

PE busbar system (additional)

	Cross-section [mm]	Type
	20 x 5	EN 13601-Cu ETP-R250-**20x5**-RD
	30 x 5	EN 13601-Cu ETP-R250-**30x5**-RD
	40 x 5	EN 13601-Cu ETP-R250-**40x5**-RD

Cubicle equipment

	Cross-section [mm]	Type
	50 x 5	EN 13601-Cu ETP-R250-**50x5**-RD
	60 x 10	EN 13601-Cu ETP-R250-**60x10**-RD
	80 x 10	EN 13601-Cu ETP-R250-**80x10**-RD
	100 x 10	EN 13601-Cu ETP-R250-**100x10**-RD
	120 x 10	EN 13601-Cu ETP-R250-**120x10**-RD
	160 x 10	EN 13601-Cu ETP-R250-**160x10**-RD

Connection terminal

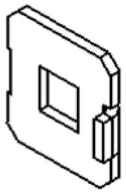
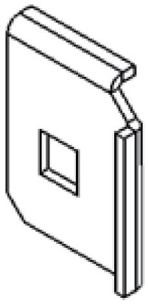
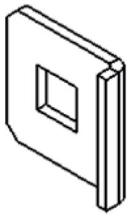
	Cross-section [mm]	Type
	25 x 5	EN 13601-Cu ETP-R250-**25x5**-RD

Finishing

Method	Use in switchgear systems	Coating thicknesses	Additional information
Galvanic tin-plating Cu / Sn8 DIN 50965	Not recommended Danger: Whisker formation	Tin semi-gloss min. 8 µm max. 20 µm	Application is only permitted if the potential hazard risk due to whisker formation has been checked and excluded for the respective application. In order to reduce the risk of whisker formation, high current densities, overdosing of brighteners, low working temperatures and co-separation of hydrogen must be avoided. The use of chemical detachment processes ("demetallization") or mechanical detachment processes (grinding, scraping, scratching, blasting, etc.) for the removal of surface coatings that have already been applied using electroplating to workpieces (e.g. busbars or contact parts), for the processing of incorrectly galvanized workpieces or workpieces that have become unusable for further processing, is not allowed. A new, subsequent second galvanic coating of surface coatings that have already been applied using electroplating to workpieces (e.g. busbars or contact parts) is, in the case of defective workpieces after the application of removal processes (post-processing of surface coatings applied using electroplating) or if the layer thickness is too low, not allowed.
Galvanic tin-plating with lower nickel content Cu / Ni5Sn3 DIN 50965	Conditionally recommended Danger: Whisker formation	Tin semi-gloss min. 3 µm max. 10 µm Sulfamate nickel min. 5 µm max. 30 µm	Application is only permitted if the potential hazard risk due to whisker formation has been checked and excluded for the respective application. In order to reduce the risk of whisker formation, high current densities, overdosing of brighteners, low working temperatures and co-separation of hydrogen must be avoided. The use of chemical detachment processes ("demetallization") or mechanical detachment processes (grinding, scraping, scratching, blasting, etc.) for the removal of surface coatings that have already been applied using electroplating to workpieces (e.g. busbars or contact parts), for the processing of incorrectly galvanized workpieces or workpieces that have become unusable for further processing, is not allowed. A new, subsequent second galvanic coating of surface coatings that have already been applied using electroplating to workpieces (e.g. busbars or contact parts) is, in the case of defective workpieces after the application of removal processes (post-processing of surface coatings applied using electroplating) or if the layer thickness is too low, not allowed.
Galvanic silver coating Cu / Ag3	Recommended	Silver 99.9 % shiny Hardness: 80 – 120 HV min. 3 µm	-

3.8 Aluminum busbar

Special washers are required for the bolted connections of aluminum bars.

Article No.	Designation		Application
8PQ9400-1BA55	Special washer Type A		Main busbar Distribution busbar non-cascaded 20 x 10 mm
8PQ9400-1BA56	Special washer Type B		Distribution busbar non-cascaded 40 x 10 mm and 50 x 10 mm
8PQ9400-1BA57	Special washer Type C		Distribution busbar non-cascaded 30 x 10 mm
8PQ9400-1BA58	Busbar clamp		Distribution busbar cascaded

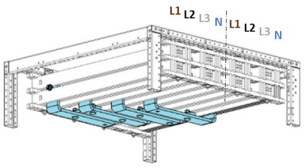
Additional documentation in SIMARIS

Document	Topic
8PQ9803-8AA71	Main busbar system
8PQ9803-8AA72	Connection of distribution busbar cascaded to main busbar top / bottom
8PQ9803-8AA73	Connection of distribution busbar non-cascaded to main busbar top / bottom
8PQ9803-8AA74	Connection of distribution busbar non-cascaded to main busbar rear
8PQ9803-8AA76	Main busbar connections
8PQ9803-8AA77	Distribution busbars

Note

Same torques for screw connections, regardless of conductor material aluminum or copper. See Standard part connections (Page 65).

3.9 Main busbar current compensation



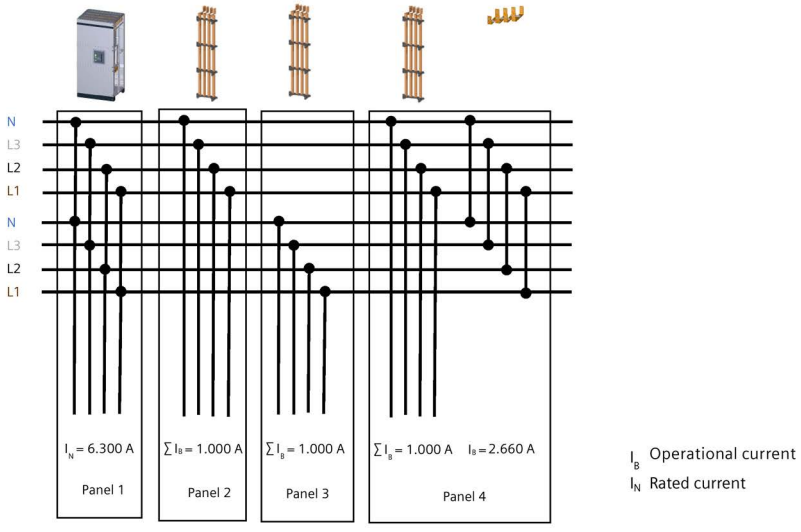
Busbar systems Duplex I_N > 3 200 A – 6 300 A

Required if sum of operational currents
IP41 $\sum I_B$ > 2 660 A
IP55 $\sum I_B$ > 2 400 A

The following cubicle is not a circuit breaker cubicle (ACB, MCCB)

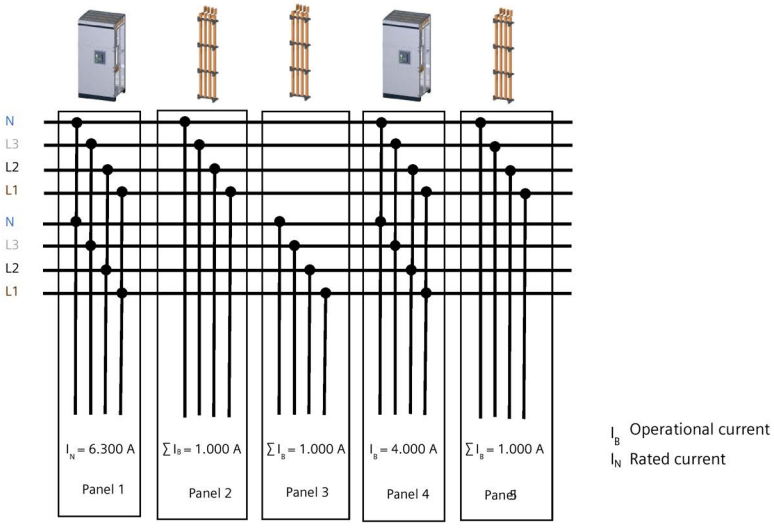
Example 1:

- Two IP41 outgoing feeder cubicles with $\sum I_B$ = 1 000 A
- Current compensation required in field 4



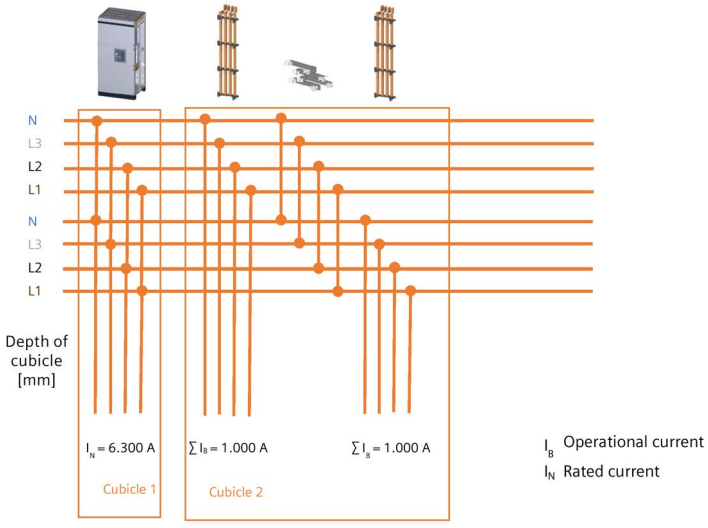
Example 2:

- Two IP41 outgoing feeder cubicles with ∑ I_B = 1 000 A
- Current compensation via 3WA outgoing circuit field 4



Example 3:

- Outgoing feeder cubicle with two field distribution busbars
- Current compensation takes place within distribution busbars



Current compensation IP40

Max. additional power loss per panel 1 000 W

	Depth [mm]	Rated operational current Inc for different ambient temperatures [A]							Rated insulation voltage Ui [V]	Rated impulse withstand voltage Uimp [kV]
		20 °C	25 °C	30 °C	35 °C	40 °C	45 °C	50 °C		
	800	2 870	2 810	2 740	**2 660**	2 600	2 520	2 450	1 000	8
Note: The balance rails were tested in two arrays with the largest cross-sections available (2 x 2 [40 x 10] mm^2). This means the balance rails can also be used for smaller cross-sections.										

Current compensation IP55

Max. additional power loss per panel 1 000 W

	Depth [mm]	Rated operational current Inc for different ambient temperatures [A]							Rated insulation voltage Ui [V]	Rated impulse withstand voltage Uimp [kV]
		20 °C	25 °C	30 °C	35 °C	40 °C	45 °C	50 °C		
	800	2 580	2 520	2 460	**2 400**	2 330	2 270	2 200	1 000	8
Note: The balance rails were tested in two arrays with the largest cross-sections available (2 x 2 [40 x 10] mm^2). This means the balance rails can also be used for smaller cross-sections.										

3.10 PE busbar system

Dimensioning is performed by means of the SIMARIS configuration. The following options are available:

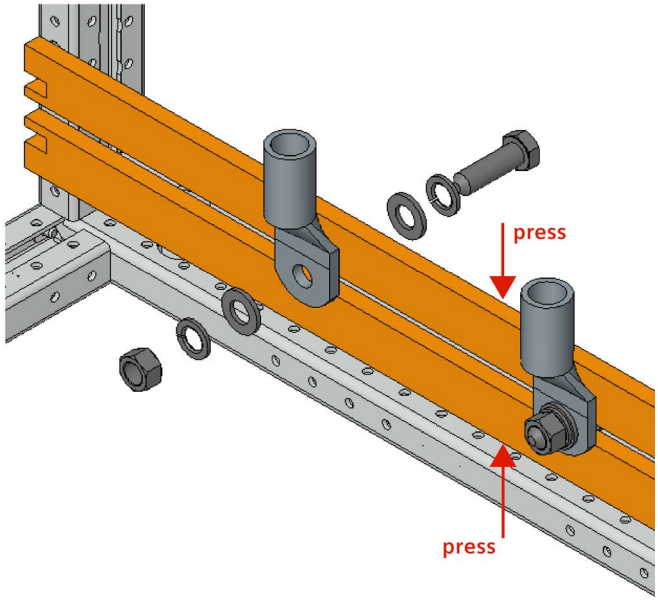
1) Based on IEC 61439-1, Table 5

Cross-sectional area of the line conductor S [mm²]	**Minimum cross-section of the corresponding protective conductor (PE, PEN) S_p [mm²]**
S ≤ 16	S
16 < S ≤ 35	16
35 < S ≤ 400	S /2
400 < S ≤ 800	200
800 < S	S /4

2) Dimensioning according to design proof

Connection - Copper

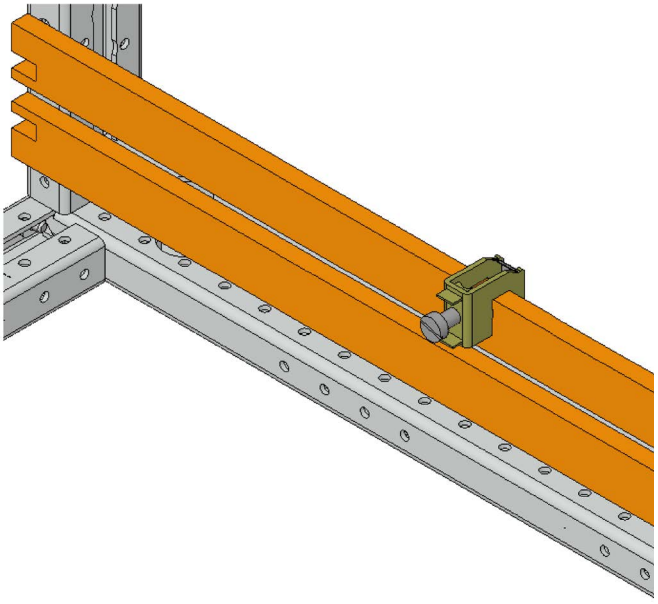
The PE cables are connected directly to the busbar as shown in the images below.



Cable lug

Connection is made in the space between the conductors per phase.

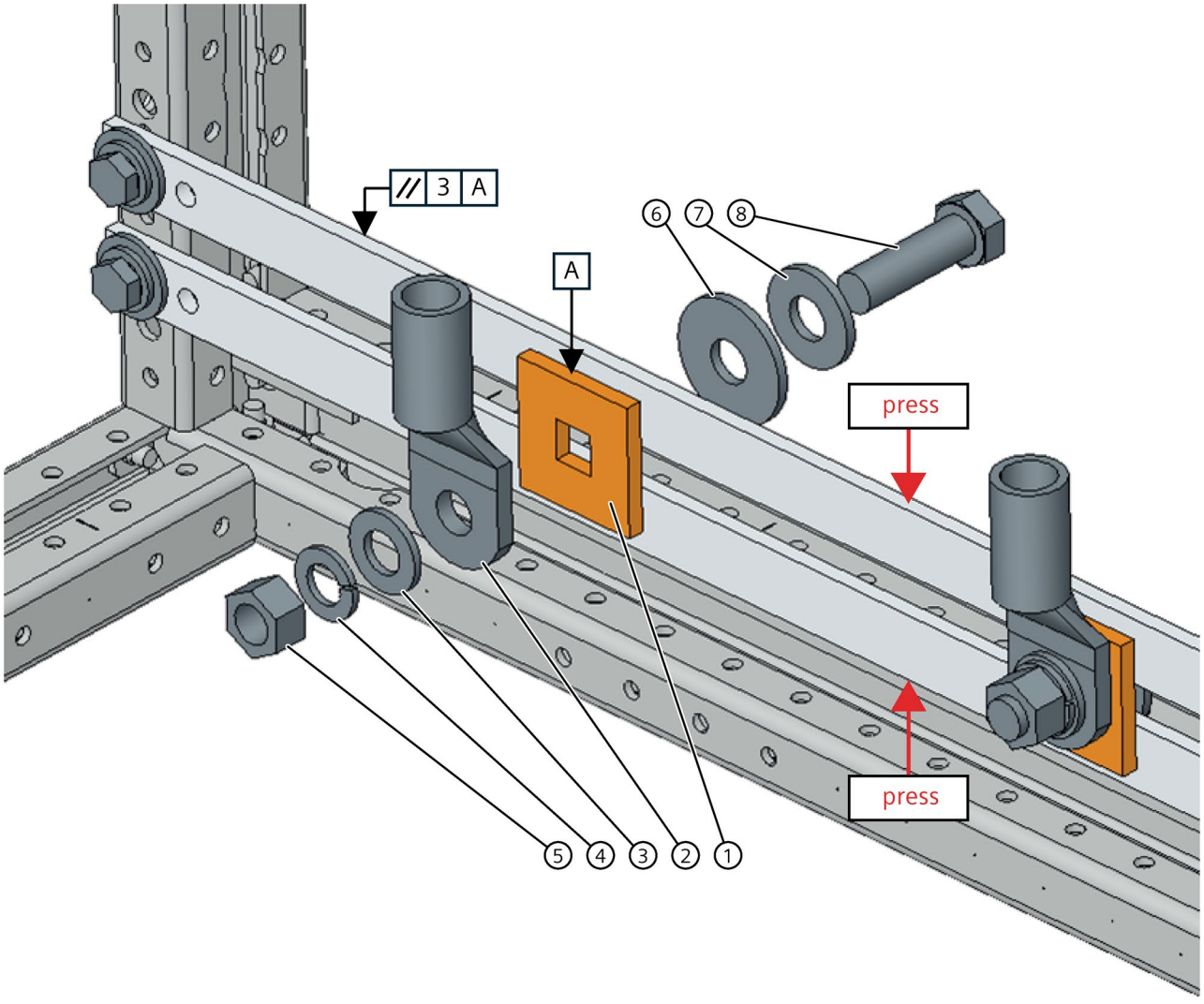
It is recommended to press the two copper bars together with a screw clamp during installation.

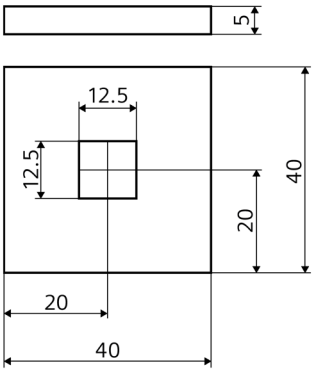


Plug-in connection terminal

Smaller cross sections can be attached with a plug-in connection terminal

Connection aluminum



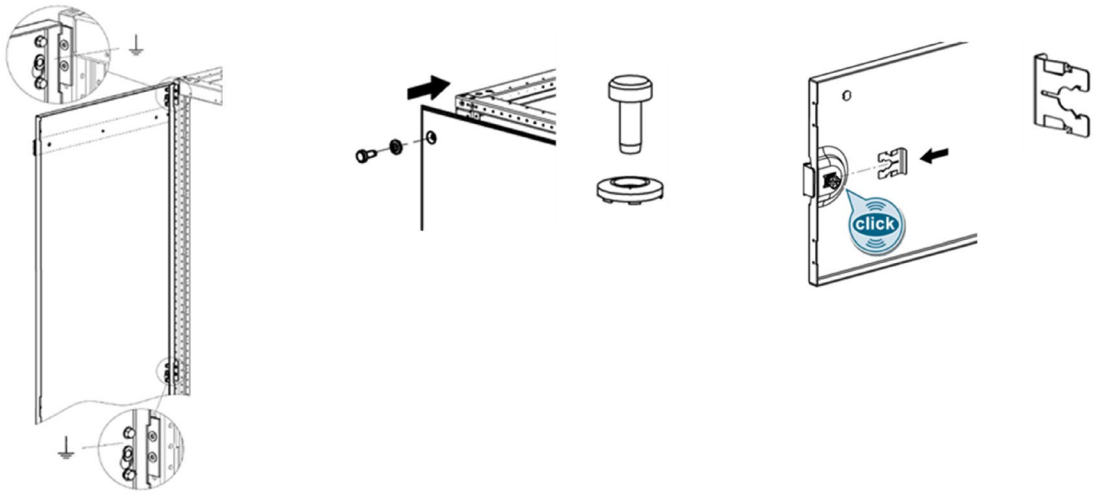


1 Copper spacer
2 Cable lug
3 Washer DIN EN ISO 7089
4 Spring lock washer SN 60727
5 Hexagon nut DIN EN ISO 4032
6 Washer large series DIN EN ISO 7093-1
7 Clamping washer DIN 6796
8 Hexagonal bolt EN ISO 4014 / 4017
The use of suitable plug-in connection terminals is also possible.

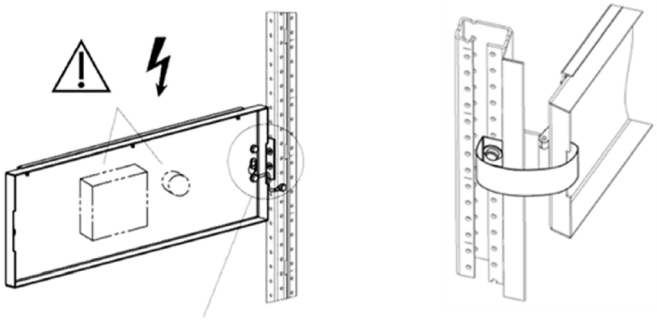
3.11 Grounding concept

Within the switchgear and controlgear assembly

The switchboard is designed to provide a conductive connection between all metal parts of the system when properly installed.



Door mountings require additional grounding measures, which are to be dimensioned as follows:



Rated operational current I_e **A**	**Minimum cross-section for protective conductor S** **mm²**
$I_e \leq 20$	Cross-section of the line conductor
$20 < I_e \leq 25$	2.5
$25 < I_e \leq 32$	4
$32 < I_e \leq 63$	6
$63 < I_e$	10

Table 3 - Cross-section für protective conductors made from copper (8.4.3.2.2)

3.12 Cable connection

Conductor cross-section for internal wiring

Rated current I_n **A**	**Cable cross-sections (stranded)**  **mm²**
8	1
12	1.5
20	2.5
25	4
32	6
50	10
65	16
85	25
115	35
150	50
175	70 or 2 x 35
225	95 or 2 x 50
250	120 or 2 x 50
275	2 x 50
300	2 x 70
350	2 x 95
375	2 x 95
400	2 x 95
450	2 x 150 or 3 x 70
500	2 x 150 or 3 x 95
630	2 x 185

Note: if not otherwise specified in the installation instructions of the assembly kits.

Laying cables and leads

Leads without short-circuit protection are potentially very hazardous and must conform to the conditions stipulated in IEC 60439-1, subsection 7.5.5.3. Either use leads which are specially protected by virtue of their insulation or increase the protection against a short circuit occurring by laying leads with basic insulation (IEC 60439-1, Table 5).

Control leads may not be laid in cable ducts.

Connection media

Multi-core cable connection

Application	Temperature range	Specification	Insulation
 Main busbar	-55 °C to +135 °C	ETEF	7YI1 according to DIN VDE 0207-6
 Main busbar vertical	-55 °C to +135 °C	ETEF	7YI1 according to DIN VDE 0207-6
 Distribution busbar	-40 °C to +90 °C	PVC (H05V2-K; H07V2-K)	TI3 according to DIN VDE 0281-1

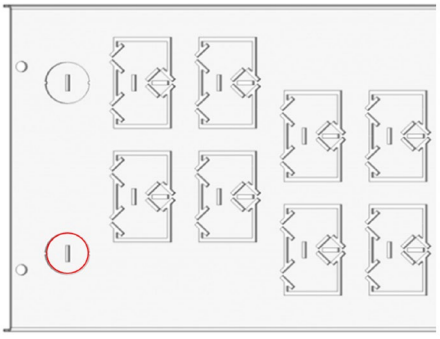


Connection of flexible busbars

Application	Temperature range	Specification	Insulation
 Main busbar	-55 °C to +135 °C	Manufacturer nVent ERIFLEX Flexibar SUMMUM	Silicone
 Main busbar vertical	-55 °C to +135 °C	Manufacturer nVent ERIFLEX Flexibar SUMMUM	Silicone
 Distribution busbar	-40 °C to +90 °C	Manufacturer nVent ERIFLEX Flexibar Advanced	Thermoplastic elastomer

3.13 Control wiring

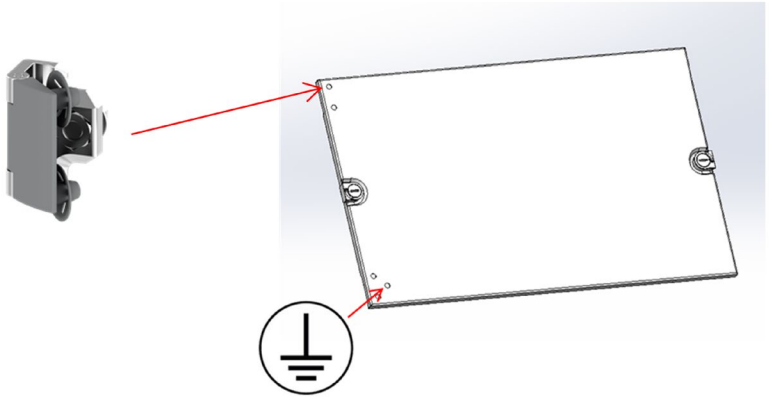
The following cut-outs for control cables are found in almost all separation components and mounting plates. These can be easily broken out with a screwdriver for cable feed-through:



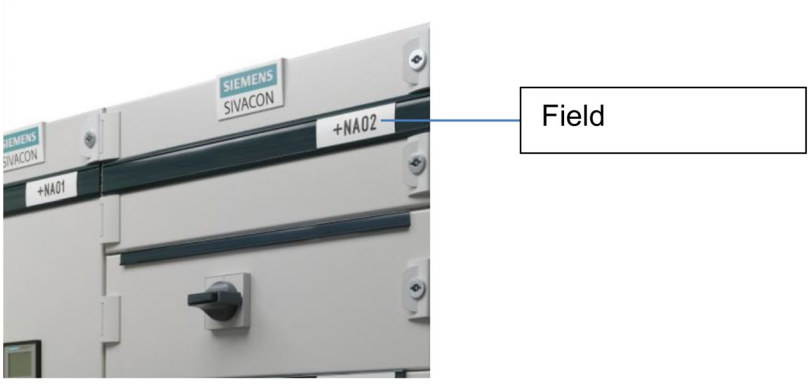
All cubicle doors are prepared for mounting internal door struts. The additionally available inner struts make it easy to organize the control wiring:



All covers are prepared for fitting of optional hinges:



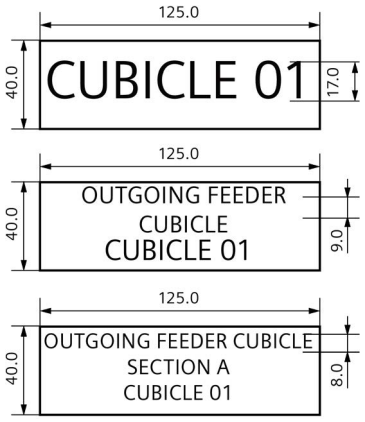
3.14 Cubicle marking



Suitable for inscription plates

- Printed carton with transparent cover
- Engraved Resopal 0.8 mm thickness

Inscription examples



3.15 Rated diversity factors

The following service factors apply unless otherwise agreed between the installer of the switchgear assembly and the operator of the equipment.

Load type	**Assumed service factor**
2 - 3 Circuits	0.9
4 - 5 Circuits	0.8
6 - 9 Circuits	0.7
Actuator	0.2
Motors ≤ 100 kW	0.8
Motors > 100 kW	1

According to IEC 61439-2, Table 101

Assembling

4

4.1 Tools

In addition to general workshop equipment (e.g., hammer, tape measure, etc.), the following tools are required for the mechanical assembly:

- Battery screwdriver with an adjustable torque (4 Nm, 8 Nm)
- Torx T30, M6 x 50 mm
- Torx T30, M6 x 200 mm MLFB: 8PQ9400-0BA10
- A torque spanner with setting ranges up to 90 Nm
- Philips screwdriver, size 2
- Open-end spanners and hexagon-head attachment for the following standard threads according to ISO 4014 / ISO 4017

Thread	Width across flats
M6	SW10
M8	SW13
M10	SW16
M12	SW18

4.2 Tools for copper processing

The following punching tools are required:

Stamp	Thread	Application
ø 7.0	M6	Screw connection
ø 7.4	M8	Thread-forming screw
ø 14.0	M12	Screw connection
9.0 x 9.0	M8	Screw connection
11.0 x 11.0	M10	Screw connection
11.0 x 16.0	M10	Screw connection
12.5 x 12.5	M12	Screw connection
32 x 8		Separating die

4.3 Personal protective equipment

To avoid cutting injuries from sheet metal parts, it is strongly recommended to wear protective gloves and safety shoes during all installation work:

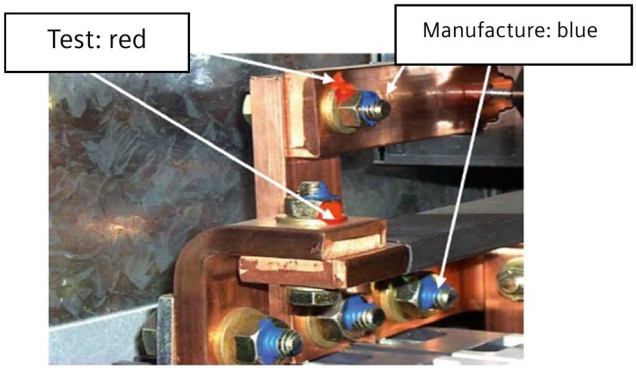




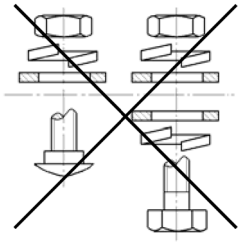
4.4 Bolted connections

Color coding of torque-tested bolted connections

In order to ensure the properties determined in the type tests, compliance with the torque specifications during manufacture and testing is of decisive importance. This is ensured by color coding with dots of paint via two movable connection elements.



Non-permissible bolted connections



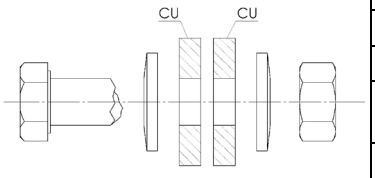
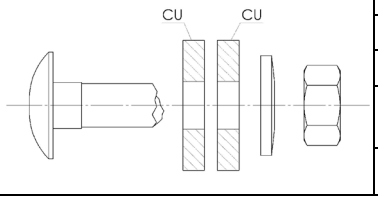
The resilient effect of bolted connections with a spring lock washer conforming to DIN 128 is diminished at relatively low prestressing forces. This makes them ineffective as a means of securing the setting.

4.5 Standard part connections

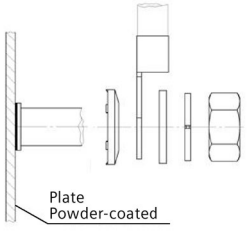
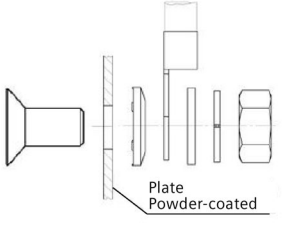
Notes

- Values invalid if not otherwise specified in the installation instructions of the assembly kits.
- Devices are to be connected at the torques which are specified in the operating instructions for the devices.
- Strength class 8.8

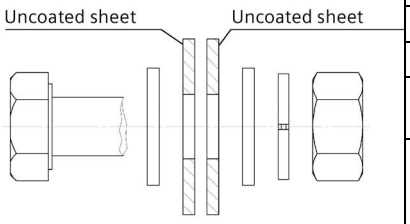
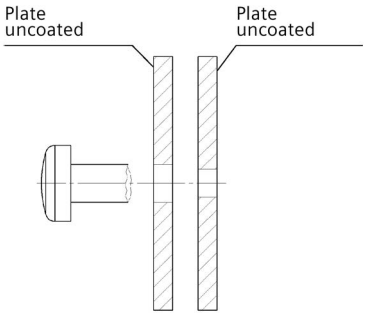
Copper and copper

<table>
<tr><th>Standard parts</th><th>Schematic diagram</th><th>References</th></tr>
<tr><td rowspan="4">1x hexagon socket screw
EN ISO 4014/4017
2x clamping washers DIN 6796
1 x hexagon nut
EN ISO 4032</td><td rowspan="4">
</td><td>Tightening torque (Nm)</td></tr>
<tr><td><table>
<tr><th>M4</th><th>M5</th><th>M6</th><th>M8</th><th>M10</th><th>M12</th><th>M16</th></tr>
<tr><td></td><td></td><td>8</td><td>20</td><td>40</td><td>70</td><td></td></tr>
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<tr><td>Testing torque 85% of the tightening torque</td></tr>
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<tr><td></td><td></td><td>6.8</td><td>17</td><td>34</td><td>60</td><td></td></tr>
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<tr><td rowspan="4">1x cup head square neck bolt DIN 603
1x clamping washer DIN 6796
1x hexagonal nut, EN ISO 4032</td><td rowspan="4">
</td><td>Tightening torque (Nm)</td></tr>
<tr><td><table>
<tr><th>M4</th><th>M5</th><th>M6</th><th>M8</th><th>M10</th><th>M12</th><th>M16</th></tr>
<tr><td></td><td></td><td></td><td>20</td><td>40</td><td>70</td><td></td></tr>
</table></td></tr>
<tr><td>Testing torque 85% of the tightening torque</td></tr>
<tr><td><table>
<tr><td></td><td></td><td></td><td>17</td><td>34</td><td>60</td><td></td></tr>
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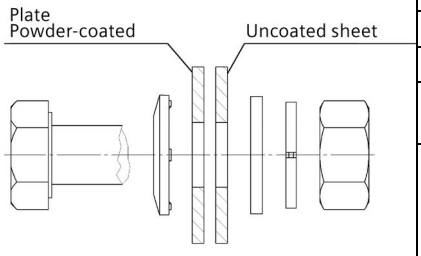
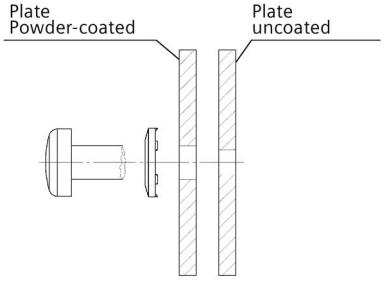
Grounding connections

<table>
<tr><th>Standard parts</th><th>Schematic diagram</th><th>References</th></tr>
<tr><td rowspan="4">1x setbolt
1x contact washer SN 70093
1 x cable lug
1 x washer DIN EN ISO 7089
1x spring lock washer SN 60727
1x hexagonal nut, EN ISO 4032</td><td rowspan="4">
</td><td>Tightening torque (Nm)</td></tr>
<tr><td><table>
<tr><th>M4</th><th>M5</th><th>M6</th><th>M8</th><th>M10</th><th>M12</th><th>M16</th></tr>
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<tr><td>Testing torque 85% of the tightening torque</td></tr>
<tr><td><table>
<tr><td></td><td></td><td>8.5</td><td></td><td></td><td></td><td></td></tr>
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<tr><td rowspan="4">1x countersunk head screw SN 60062
1x contact washer SN 70093
1 x cable lug
1 x washer DIN EN ISO 7089
1x spring lock washer SN 60727
1x hexagonal nut, EN ISO 4032</td><td rowspan="4">
</td><td>Tightening torque (Nm)</td></tr>
<tr><td><table>
<tr><th>M4</th><th>M5</th><th>M6</th><th>M8</th><th>M10</th><th>M12</th><th>M16</th></tr>
<tr><td></td><td></td><td>10</td><td></td><td></td><td></td><td></td></tr>
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<tr><td>Testing torque 85% of the tightening torque</td></tr>
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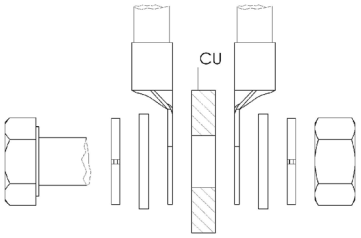
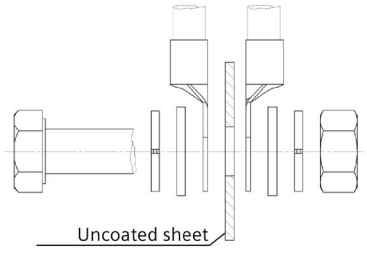
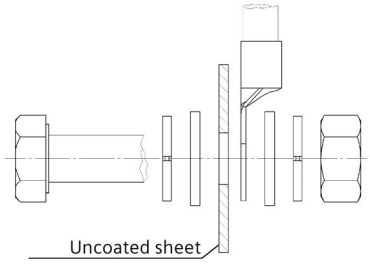
Steel and steel (zinc plated)

Standard parts	Schematic diagram	References						
1x hexagonal screw EN ISO 4014/4017 1x spring lock washer SN 60727 2x washers EN ISO 7089 1x hexagonal nut, EN ISO 4032		**Tightening torque (Nm)**						
		M4	**M5**	**M6**	**M8**	**M10**	**M12**	**M16**
		3	**6**	**8**	**20**	**40**		
		Testing torque 85% of the tightening torque						
		2.5	5	6.8	17	34		
1 x self-tapping screw DIN 7500		**Tightening torque (Nm)**						
		M4	**M5**	**M6**	**M8**	**M10**	**M12**	**M16**
		1.5	**3**	**4**				
		Testing torque 85% of the tightening torque						
		1.2	2.5	3.4				

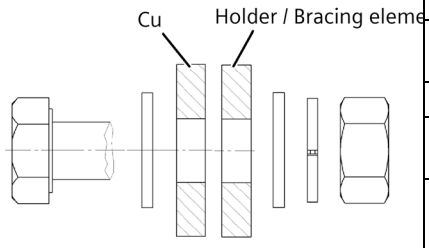
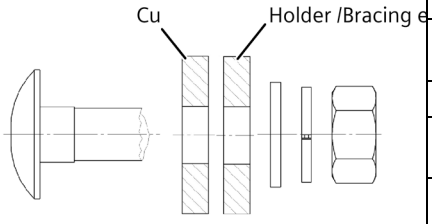
Steel and steel (coated)

Standard parts	Schematic diagram	References						
1x hexagonal screw EN ISO 4014/4017 1x contact washer SN 70093 1x spring lock washer SN 60727 1 x washer DIN EN ISO 7089 1x hexagonal nut, EN ISO 4032		**Tightening torque (Nm)**						
		M4	**M5**	**M6**	**M8**	**M10**	**M12**	**M16**
		3	**6**	**8**	**20**	**40**		
		Testing torque 85% of the tightening torque						
		2.5	5	6.8	17	34		
1 x self-tapping screw DIN 7500 1x contact washer SN 70093		**Tightening torque (Nm)**						
		M4	**M5**	**M6**	**M8**	**M10**	**M12**	**M16**
		1.5	**3**	**4**				
		Testing torque 85% of the tightening torque						
		1.2	**2.5**	**3.4**				

Connection of cable lugs

<table>
<tr><th>Standard parts</th><th>Schematic diagram</th><th>References</th></tr>
<tr><td rowspan="5">1x hexagonal screw EN ISO 4014/4017
2x spring lock washer SN 60727
2 x washers DIN EN ISO 7089
1x hexagonal nut, EN ISO 4032
2 x cable lugs</td><td rowspan="5">
</td><td>Tightening torque (Nm)</td></tr>
<tr><td>M4 M5 M6 M8 M10 M12 M16</td></tr>
<tr><td>10 20 40 70</td></tr>
<tr><td>Testing torque 85% of the tightening torque</td></tr>
<tr><td>8.5 17 34 60</td></tr>
<tr><td rowspan="5">1x hexagonal screw EN ISO 4014/4017
2x spring lock washer SN 60727
2 x washers DIN EN ISO 7089
1x hexagonal nut, EN ISO 4032
2 x cable lugs</td><td rowspan="5">
</td><td>Tightening torque (Nm)</td></tr>
<tr><td>M4 M5 M6 M8 M10 M12 M16</td></tr>
<tr><td>10</td></tr>
<tr><td>Testing torque 85% of the tightening torque</td></tr>
<tr><td>8.5</td></tr>
<tr><td rowspan="5">1x hexagonal screw EN ISO 4014/4017
2x spring lock washer SN 60727
2 x washers DIN EN ISO 7089
1x hexagonal nut, EN ISO 4032
1 x cable lug</td><td rowspan="5">
</td><td>Tightening torque (Nm)</td></tr>
<tr><td>M4 M5 M6 M8 M10 M12 M16</td></tr>
<tr><td>10</td></tr>
<tr><td>Testing torque 85% of the tightening torque</td></tr>
<tr><td>8.5</td></tr>
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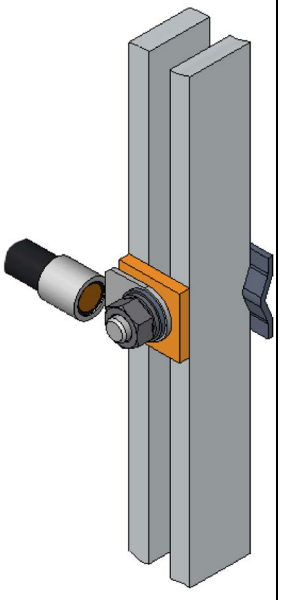
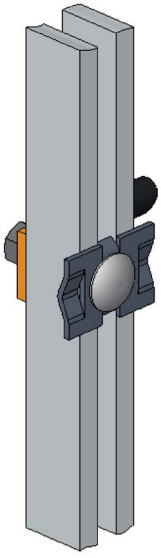
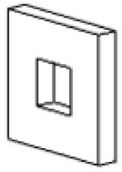
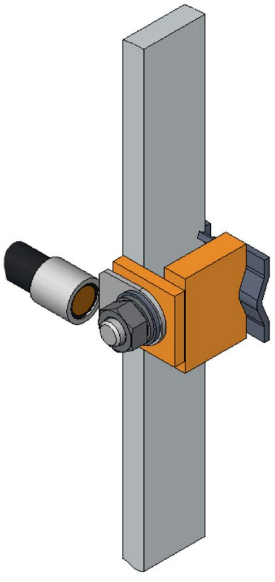
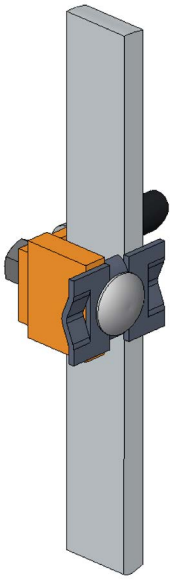
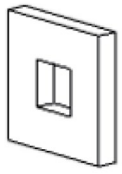
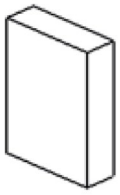
Copper and holders, bracing elements made of duroplast - glass-mat base laminate / glass-fiber-reinforced composite material

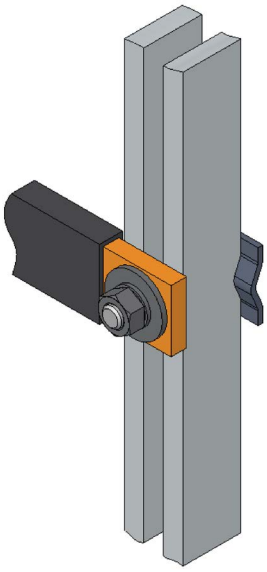
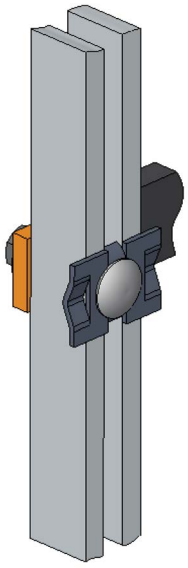
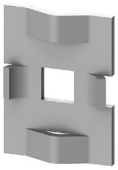
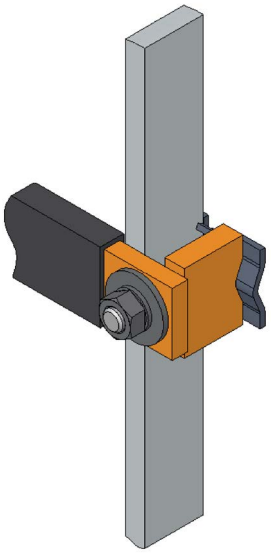
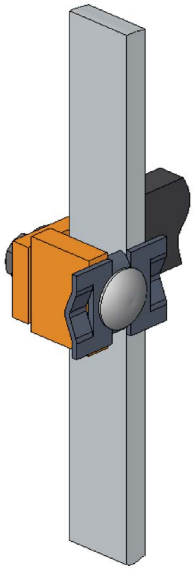
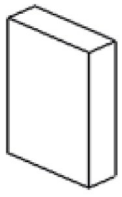
<table>
<tr><th>Standard part</th><th>Schematic diagram</th><th colspan="7">References</th></tr>
<tr><td rowspan="4">1x hexagonal bolt EN ISO 4014 / 4017
1x clamping washer DIN 6796
1x washer EN ISO 7089
1x spring lock washer SN 60727
1x hexagonal nut, EN ISO 4032</td><td rowspan="4">
</td><td colspan="7">Tightening torque (Nm)</td></tr>
<tr><td>M4</td><td>M5</td><td>M6</td><td>M8</td><td>M10</td><td>M12</td><td>M16</td></tr>
<tr><td></td><td></td><td>8</td><td>20</td><td>40</td><td>70</td><td></td></tr>
<tr><td colspan="7">Testing torque 85% of the tightening torque</td></tr>
<tr><td></td><td></td><td>6.8</td><td>17</td><td>34</td><td>60</td><td></td></tr>
<tr><td rowspan="4">1x cup head square neck bolt DIN 603
1x washer EN ISO 7089
1x spring lock washer SN 60727
1x hexagonal nut, EN ISO 4032</td><td rowspan="4">
</td><td colspan="7">Tightening torque (Nm)</td></tr>
<tr><td>M4</td><td>M5</td><td>M6</td><td>M8</td><td>M10</td><td>M12</td><td>M16</td></tr>
<tr><td></td><td></td><td></td><td>20</td><td>40</td><td>70</td><td></td></tr>
<tr><td colspan="7">Testing torque 85% of the tightening torque</td></tr>
<tr><td></td><td></td><td></td><td>17</td><td>34</td><td>60</td><td></td></tr>
</table>

4.6 Screw connection on vertical distribution busbars

Screw connection distribution busbar with cable lugs or flexibars

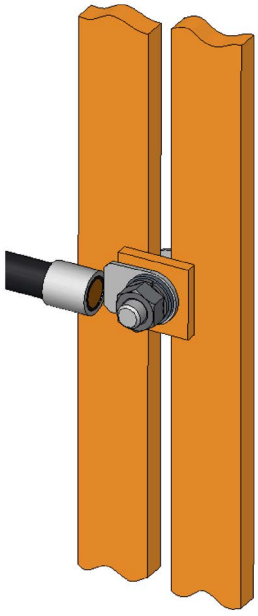
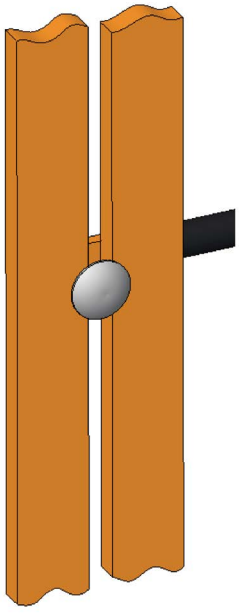
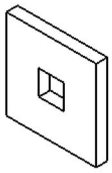
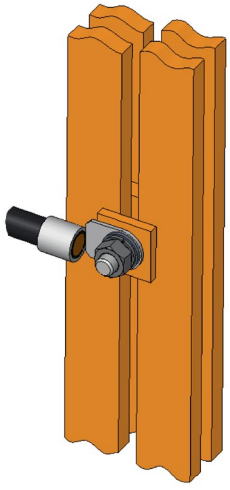
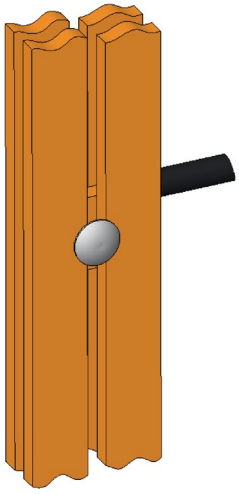
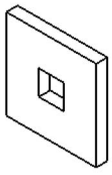
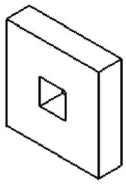
Connection by solid copper bars to aluminum distribution busbars; see mounting instruction 8PQ9803-8AA77

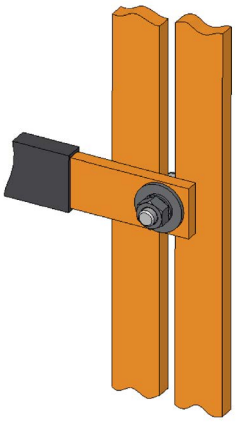
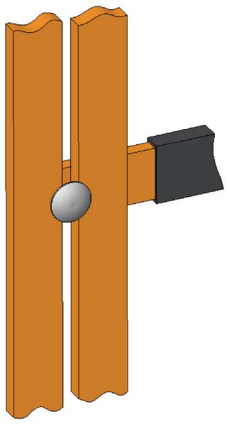
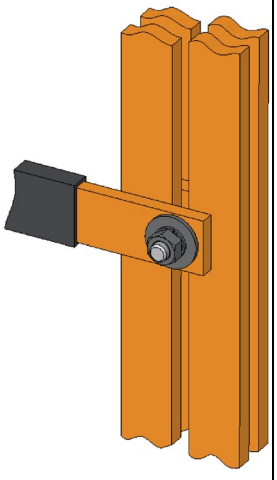
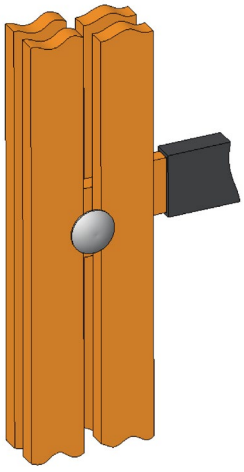
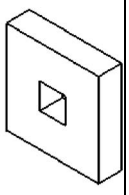
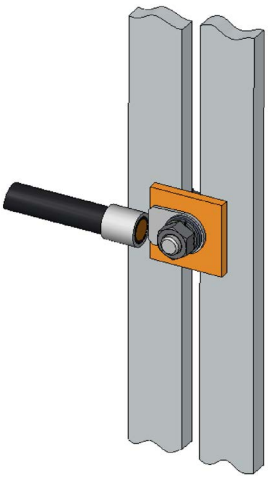
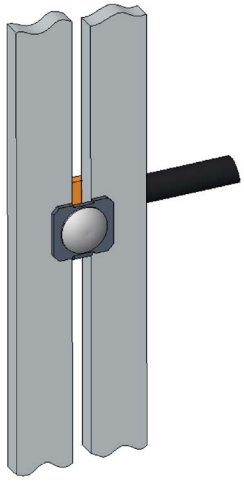
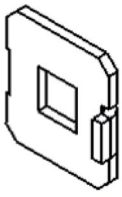
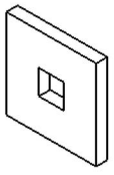
Distribution busbar cascaded						
Connection medium	Number of sub-conductors	View		Mounting parts (M10 screw connection)		
		Front	Rear	Special washers	Copper spacer	Standard parts
Cable lug	2 Material: Aluminum or copper			Busbar clamp 	30 x 30 x 5 	Cup head bolt DIN 603 Washer DIN EN ISO 7089 Spring lock washer SN 60727 Hexagon nut DIN EN ISO 4032
Cable lug	1 Material: Aluminum or copper			Busbar clamp 	30 x 30 x 5  30 x 40 x 10 	Cup head bolt DIN 603 Washer DIN EN ISO 7089 Spring lock washer SN 60727 Hexagon nut DIN EN ISO 4032

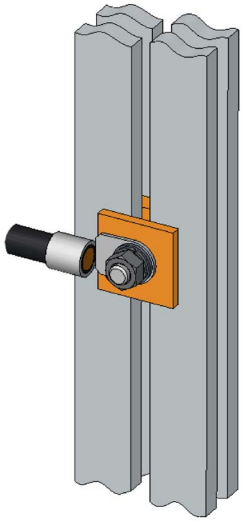
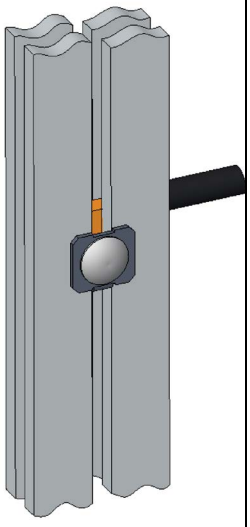
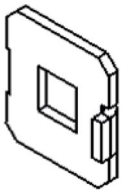
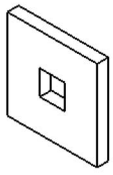
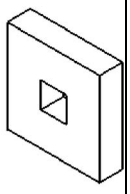
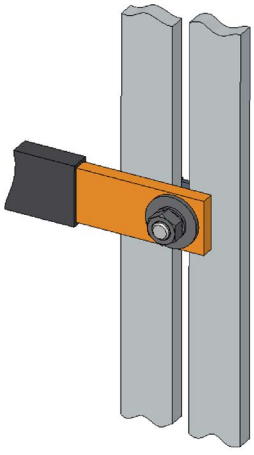
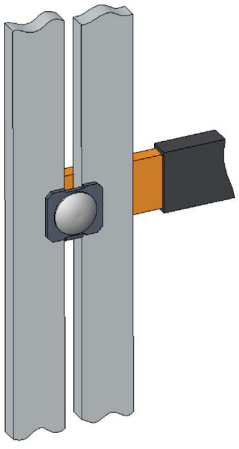
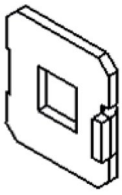
Distribution busbar cascaded						
Connection medium	Number of sub-conductors	View		Mounting parts (M10 screw connection)		
		Front	Rear	Special washers	Copper spacer	Standard parts
Flexibar	2 Material: Aluminum or copper			Busbar clamp 	Not required	Cup head bolt DIN 603 Washer large series DIN EN ISO 7093-1 Spring lock washer SN 60727 Hexagon nut DIN EN ISO 4032
Flexibar	1 Material: Aluminum or copper			Busbar clamp 	30 x 40 x 10 	Cup head bolt DIN 603 Washer large series DIN EN ISO 7093-1 Spring lock washer SN 60727 Hexagon nut DIN EN ISO 4032

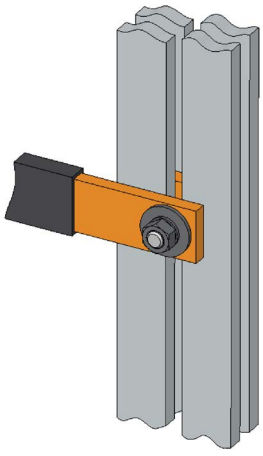
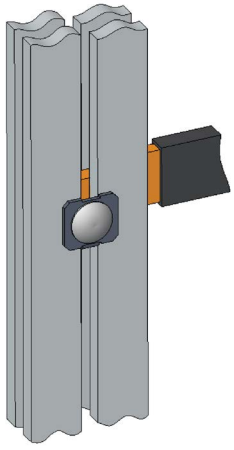
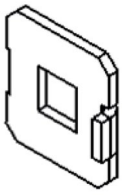
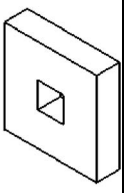
Screw connection vertical distribution busbar with cable lugs or flexibars

Connection by solid copper bars; see mounting instruction 8PQ9803-8AA77

Distribution busbar non-cascaded						
Connection medium	Number of sub-conductors	View		Mounting parts (M10 screw connection)		
		Front	Rear	Special washers	Copper spacer	Standard parts
Cable lug	2 Material: Copper			Not required	40 x 40 x 5 Cable lug support 	Cup head bolt DIN 603 Washer DIN EN ISO 7089 Spring lock washer SN 60727 Hexagon nut DIN EN ISO 4032
Cable lug	4 Material: Copper			Not required	40 x 40 x 5 Cable lug support  40 x 40 x 10 between sub-conductors 	Cup head bolt DIN 603 Washer DIN EN ISO 7089 Spring lock washer SN 60727 Hexagon nut DIN EN ISO 4032

Distribution busbar non-cascaded						
		Front	Rear	Special washers	Copper spacer	Standard parts
Flexibar	2 Material: Copper			Not required	Not required	Cup head bolt DIN 603 Washer large series DIN EN ISO 7093-1 Spring lock washer SN 60727 Hexagon nut DIN EN ISO 4032
Flexibar	4 Material: Copper			Not required	40 x 40 x 10 between sub-conductors 	Cup head bolt DIN 603 Washer large series DIN EN ISO 7093-1 Spring lock washer SN 60727 Hexagon nut DIN EN ISO 4032
Cable lug	2 Material: Aluminum			A Type 	40 x 40 x 5 Cable lug support 	Cup head bolt DIN 603 Washer DIN EN ISO 7089 Spring lock washer SN 60727 Hexagon nut DIN EN ISO 4032

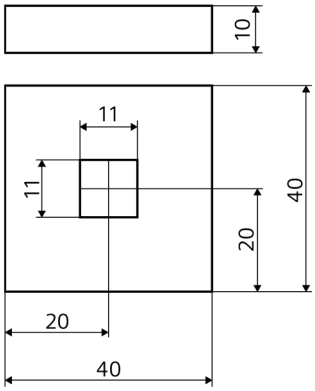
Distribution busbar non-cascaded						
Connection medium	Number of sub-conductors	View		Mounting parts (M10 screw connection)		
		Front	Rear	Special washers	Copper spacer	Standard parts
Cable lug	4 Material: Aluminum			A Type 	40 x 40 x 5 Cable lug support  40 x 40 x 10 between sub-conductors 	Cup head bolt DIN 603 Washer DIN EN ISO 7089 Spring lock washer SN 60727 Hexagon nut DIN EN ISO 4032
Flexibar	2 Material: Aluminum			A Type 	Not required	Cup head bolt DIN 603 Washer large series DIN EN ISO 7093-1 Spring lock washer SN 60727 Hexagon nut DIN EN ISO 4032

Distribution busbar non-cascaded						
Connection medium	Number of sub-conductors	View		Mounting parts (M10 screw connection)		
		Front	Rear	Special washers	Copper spacer	Standard parts
Flexibar	4 Material: Aluminum			A Type 	40 x 40 x 10 between sub-conductors 	Cup head bolt DIN 603 Washer large series DIN EN ISO 7093-1 Spring lock washer SN 60727 Hexagon nut DIN EN ISO 4032

Note

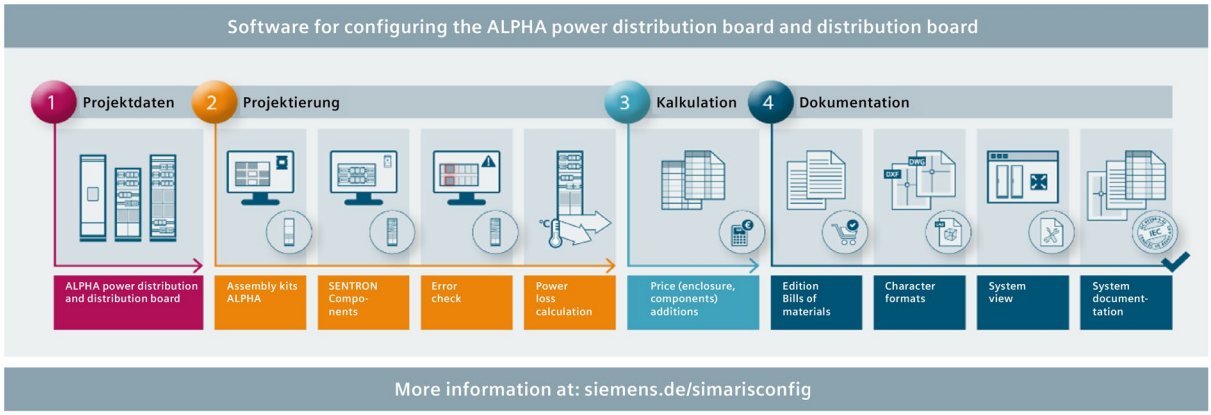
The design of the screw connection of the non-cascaded vertical distribution busbar must also be used for the connection to the main busbar.

Spacer plate



4.7 Mounting preparations

Project documentation from SIMARIS configuration



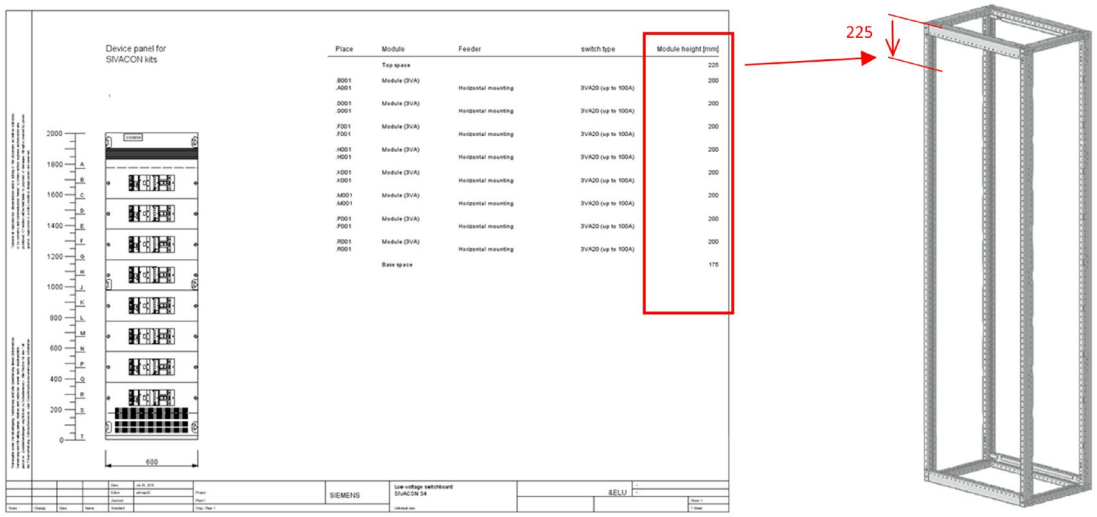
The configuration software offers extensive output options to support the assembly processes:

- Bills of materials
- Overview graphics of the entire system
- Busbars
- Equipment view per cubicle



Practical tip:

From the overview graphic you can see the module heights of the assembly kits. Mark them with a marker on the supporting structure:

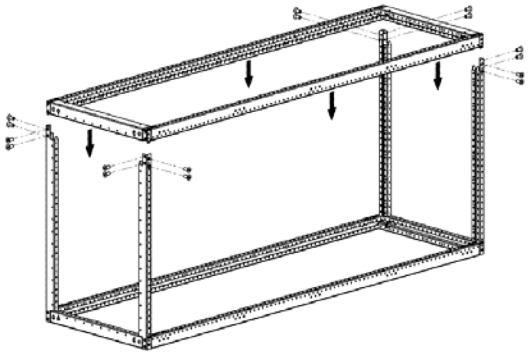
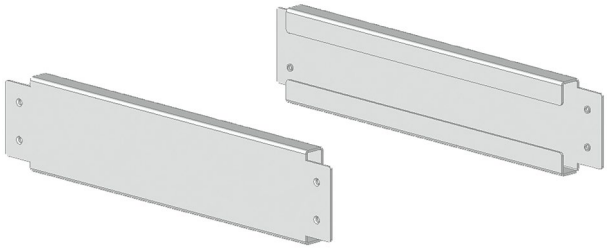
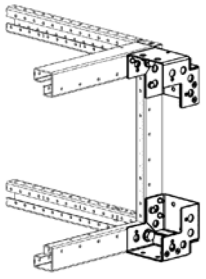
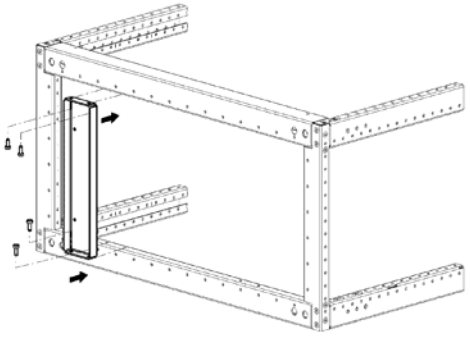


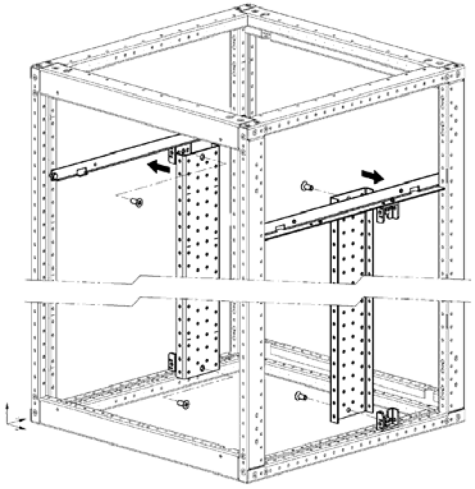
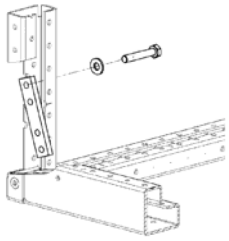
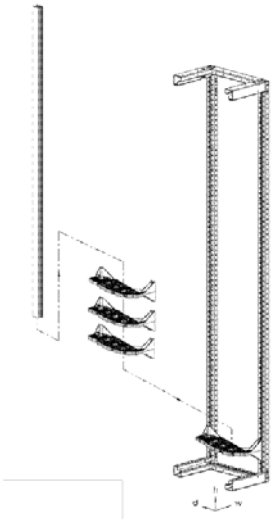
This measure makes it much easier for you to install the assembly kits at the correct mounting height and incorrect installation is avoided.

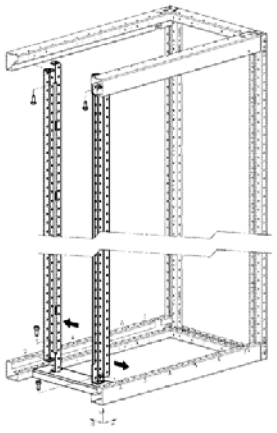
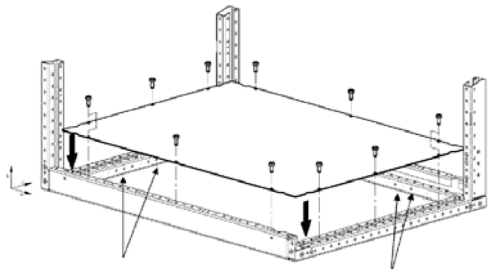
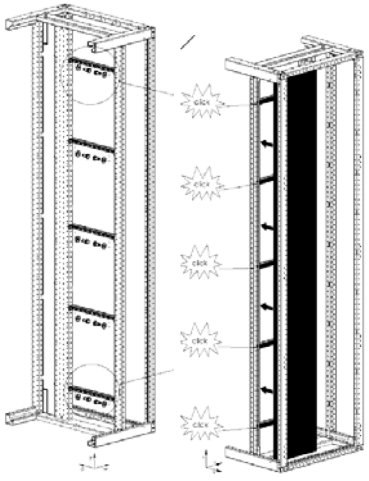
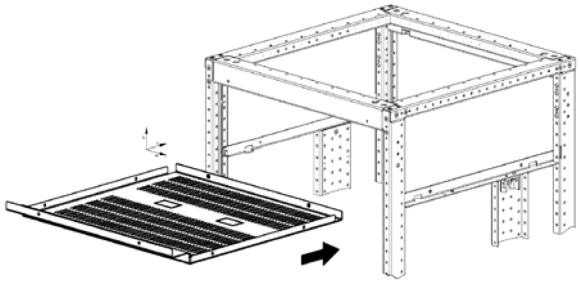
4.8 Mounting sequence

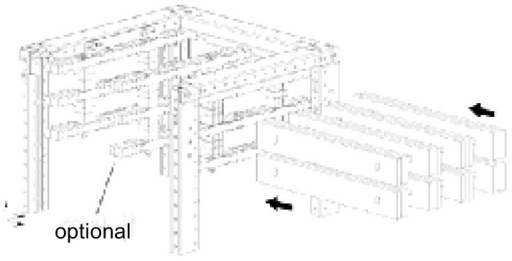
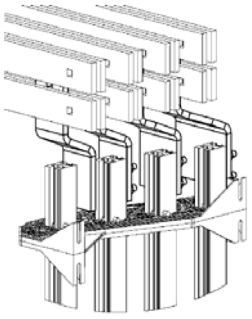
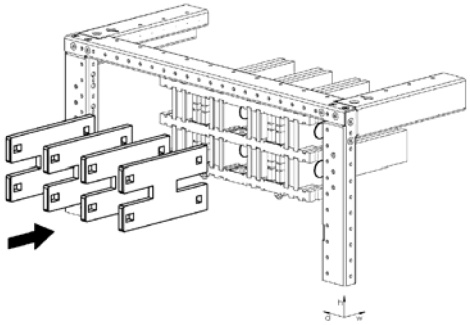
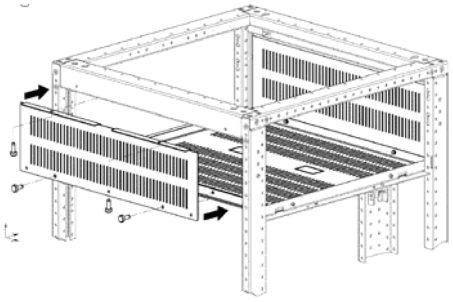
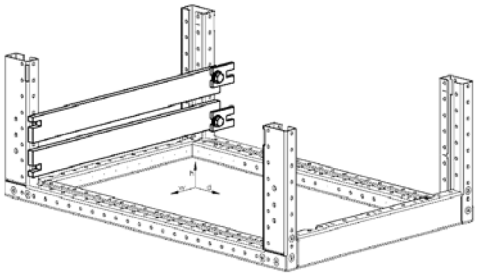
Procedure for installing the basic cubicle

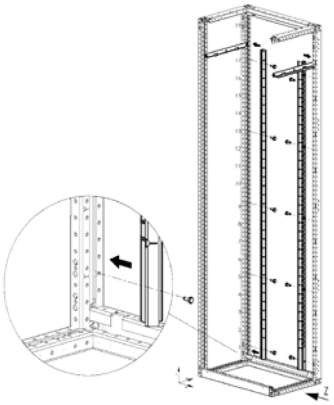
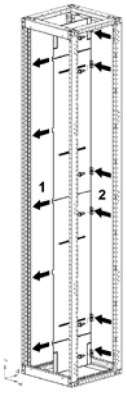
The following procedure describes installation using an example:

Installation of the supporting structure	
Installation of the base corners Optionally available transport reinforcements. 	
Installation of the lower part of the supporting structure with a function compartment split of 600 mm + 200 mm	

Installation of supporting structure without a function compartment split	
Installation of the rack connection for PE busbars	
Installation of the supports for vertical distribution busbars (cascaded or non-cascaded), with due regard for spacing between supports and device connections Installation of the vertical distribution busbars	

Installation of the supporting structure with a function compartment split of 600 mm + 200 mm	
Installation of the base plate	
Installation of the supports for separation 2b for vertical distribution busbars with due regard for the arrangement of devices and minimum spacing Installation of vertical separation 2b	
Installation of the lower part of horizontal separation 2b for main busbars	

Installation of the supports for the main busbar system Installation of the copper bars and installation of the bracing elements with due regard for permissible spaces	
Installation of the connection lugs Distribution busbar	
Installation of the connection lugs Main busbar	
Installation of the vertical parts of horizontal separation 2b for main busbars	
Installation of the PE buses	

Installation of the push-on terminal strips in the form of internal separation 3 and 4	
Installation of the cubicle partition	

Commissioning

The following documentation "8PQ9801-5AA80 Operation and Maintenance" provides you with more information on fault-free commissioning of the switchgear and controlgear assembly. As an aid, you will find a practical protocol template, which facilitates the mechanical and electrical function test.

SIVACON S4
Inbetriebsetzungs- Protokoll (Muster)
Mechanische Prüfung von Niederspannungs- Schaltanlagen

1. Daten zur Identifizierung des geprüften Objektes: Protokoll-Nr: .....

siehe Leistungsschild im linken Endfeld der Schaltanlage, Innenseite der Feld- oder oberen Fachtür

Kunde: .....
Ort: .....
Land: .....
Schaltanlage oder Anlagenteil: .....
Typ: .....
Hersteller- Ident. (Werk) -Nr.: .....
Bemessungs- Spannung: .....
Bemessungs- Kurzzeitstrom: .....

2. Schaltraum Raum- Ident.: .....

Lfd. Nr.	Inbetriebsetzungs- Schritt ausgeführt	Ja	Nein	Bemerkung
2.1	Der Raum kann ordnungsgemäß gegen unbefugten Zutritt gesichert (verschlossen) werden.			
2.2	Es wurden alle erforderlichen Maßnahmen getroffen, damit der Raum den örtlichen Sicherheitsbestimmungen entspricht. (Fluchtwege, Notbeleuchtung, Löscheinrichtungen, Hinweistafeln)			
2.3	Die Be- und Entlüftungsmaßnahmen funktionieren. (Klimaanlage funktionsfähig, Belüftungsöffnungen nicht verstellt)			
2.4	Die vorgesehenen Transporthilfen für schwere Geräte/ Einschübe sind in ordnungsgemäßem Zustand und in vorgesehener Zahl vorhanden.			
2.5.1	Das Anlagenzubehör ist entsprechend Dokumentation vollzählig (z.B. Doppelbartschlüssel, Sicherungs- Griffzange, Lampengreifer, Betätigungs- werkzeuge für Einschub-Leistungsschalter und Einschübe)			
2.5.2	Das Anlagenzubehör ist in gutem Zustand			
2.5.3	Das Anlagenzubehör ist an geeigneter Stelle untergebracht (Gut erreichbar, übersichtlich angeordnet, geschützt gegen Beschädigung und Diebstahl)			
2.6	Hinweise auf den Standort der Anlagendokumentation sind an gut sichtbarer Stelle (z.B. am Werkzeugbrett) im Schaltraum vorhanden.			

3. Schaltanlage, Allgemeines

Lfd. Nr.	Inbetriebsetzungs- Schritt ausgeführt	Ja	Nein	Bemerkung
3.1	Die Schaltanlagendokumentation ist vollständig und geordnet am vorgegebenen Ablageort greifbar (z.B. Betriebsanleitungen der Schaltanlage und der zugehörigen Geräte, sowie Gerätelisten und Schaltpläne mit aktuellem Revisionsstand).			
3.2.1	Die Beschriftung der Schaltanlagenfelder ist vollständig (Anlagen- Feld- und Abzweigbezeichnungen).			
3.2.2	Alle Stecker, Klemmen und sonstige Kabelanschluss- Stellen sind richtig und vollständig beschriftet.			
3.2.3	Kennzeichnung der externen Anschlusskabel richtig und vollständig, sofern gefordert.			
3.2.4	Betriebsmittelkennzeichen sind vollständig.			
3.2.5	Sammelschienen Kennzeichnungen wurden ersetzt, wenn beschädigt (L1, L2, L3, N, PEN, L+, L-).			
3.3	Isolationsprüfung wurde durchgeführt, bei R > 1000Ω/V der Bemessungs- Betriebsspannung wurden Fehler lokalisiert und beseitigt.			
3.4	Revision der Schaltanlagendokumentation (sofern erforderlich) wurde durchgeführt und Kopiensätze der revidierten Unterlagen an alle erforderlichen Organisationseinheiten und den Schaltanlagenhersteller verteilt.			

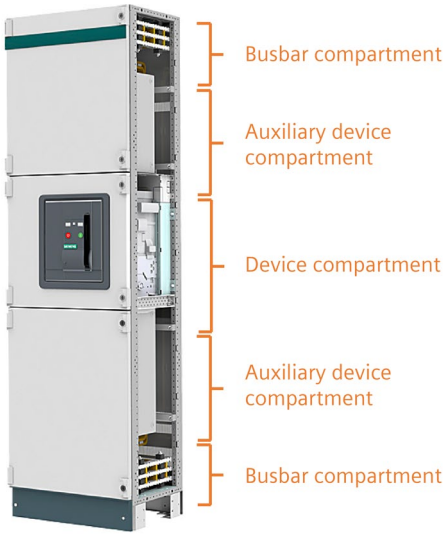
8PQ9801-5AA80 A1 de

Main busbar top / bottom

5

5.1 Incoming feeder cubicle ACB

Cubicle design



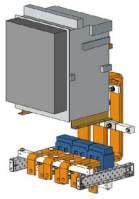
Connection

	Cable lug DIN 46235 ≤ 240 mm² M12

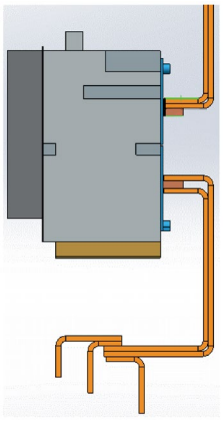
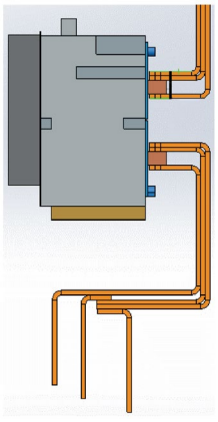
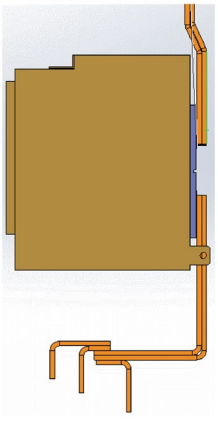
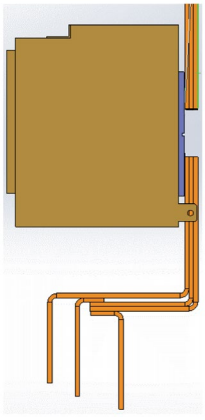
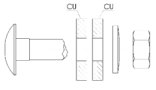
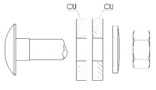
Maximum number of cables that can be connected per phase:

Size 1		Size 2		Size 3	
Up to 1 000 A	1 250 A - 2 000 A	Up to 1 600 A	2 000 A - 3 200 A	Up to 4 000 A	5 000 A - 6 300 A
6	6	12	12	14	24

Installation of transformer

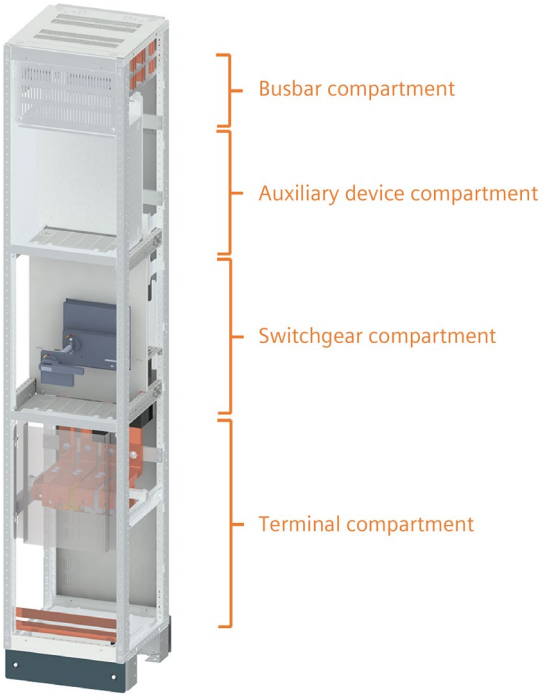
Cable connection	Size	Switch	Rated current A	Type Supplier: MBS AG
	1	3WA1106	630	ASK 561.4
		3WA1108	800	ASK 561.4
		3WA1110	1 000	ASK 561.4
		3WA1112	1 250	ASK 561.4
		3WA1116	1 600	ASK 63.6
		3WA1120	2 000	ASK 63.6
	2	3WA1225	2500	ASK 105.6
		3WA1232	3200	ASK 105.6
	3	3WA1340	4 000	ASK 127.6
		3WA1350	5 000	ASK 127.6
		3WA1363	6 300	ASK 127.6

Device connection

				
Mounting design	Fixed mounting	Fixed mounting	Withdrawable unit	Withdrawable unit
Size	1	2	1	2
Combination of standard parts				
Type	Cup head square neck bolt DIN 603	Cup head square neck bolt DIN 603	Hexagon bolt EN ISO 4014	Hexagon bolt EN ISO 4014
Strength class	8.8	8.8	8.8	8.8
Standard part definition	M12 x 55	M12 x 80	M12 x 45	M12 x 55

5.2 Infeed panel MCCB

Cubicle design



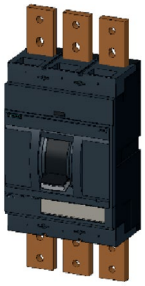
Connection:

	Cable lug DIN 46235 ≤ 240 mm² M12

Maximum number of cables that can be connected per phase:

3VA15 Up to 1 000 A	**3VA25** Up to 1 000 A	**3VA26** Up to 1 250 A	**3VA27** Up to 1600 A
4	4	6	6

Connection accessories

	Switch	Rated current [A]	Mounting design	Switch connection
	**3VA15** **3VA25**	1 000 1 000	Fixed mounting	Connection extension
	**3VA26**	1 250	Fixed mounting	Bus connectors offset
	**3VA27**	1600 A	Withdrawable unit	Front-extended

Guide frame removal instruction

Fig. 1

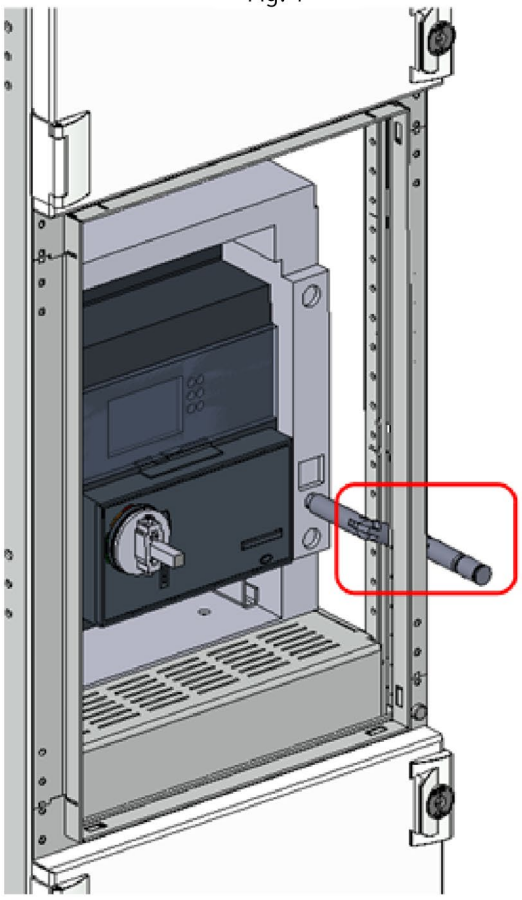
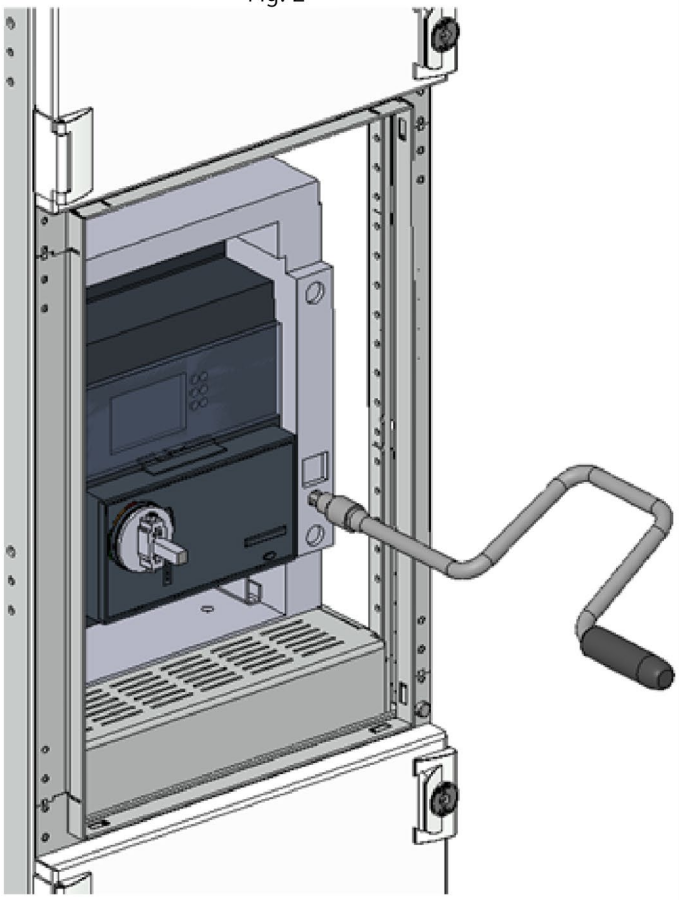


Fig. 2





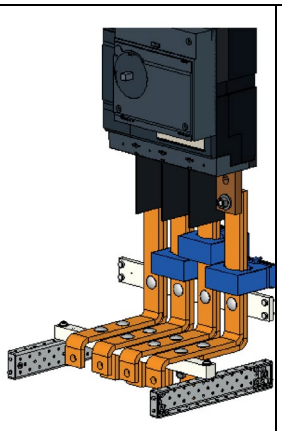
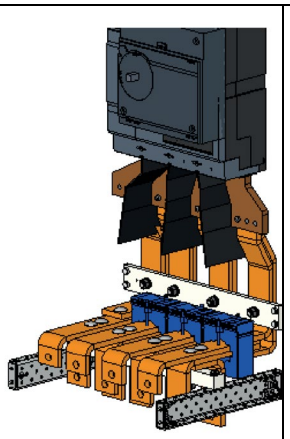
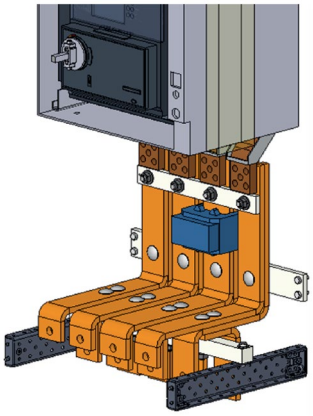
1/2" bit insert
Length 100 mm,
8 mm hexagon



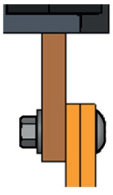
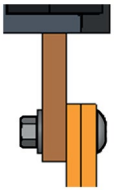
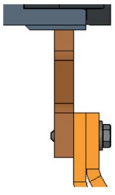
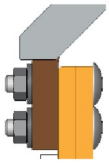
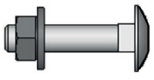
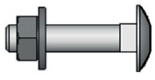
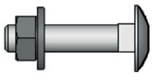
1/2" crank 395 mm

Figure 5-1 Recommended accessories

Installation of transformer

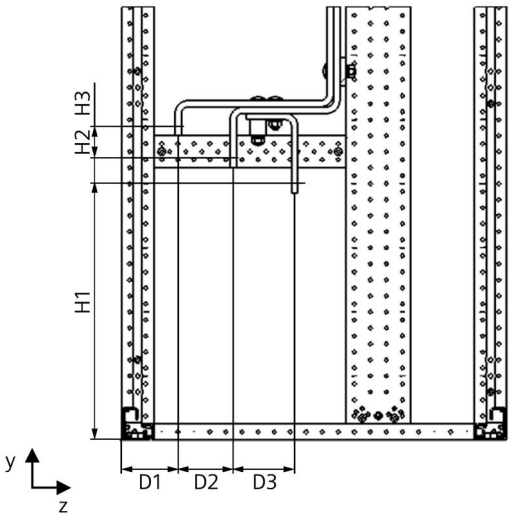
Cable connection			Switch	Rated current [A]	Type (MBS AG)
 3VA15, 3VA25	 3VA26	 3VA27 withdrawable unit - converter can only be installed on one phase	**3VA15**	1 000	ASK 561.4
			3VA25	1 000	ASK 561.4
			3VA26	1 250	ASK 561.4
			3VA27	1 600	ASK 63.6

Device connection

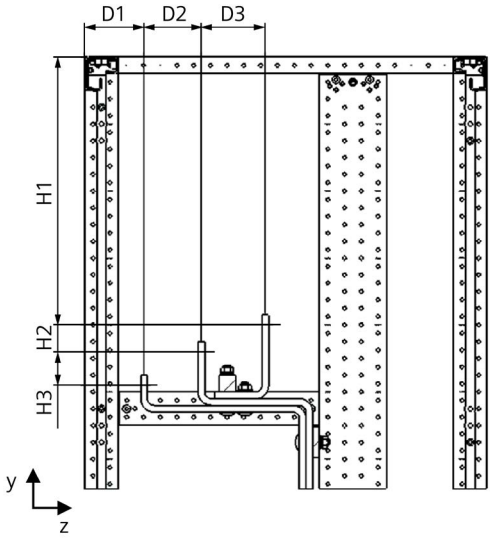
				
Size	**3VA15**	**3VA25**	**3VA26**	**3VA27**
Rated current [A]	1 000	1 000	1 250	1 600
Mounting design	Fixed mounting	Fixed mounting	Fixed mounting	Withdrawable unit
Combination of standard parts				
Screw	Cup head square neck bolt DIN 603	Cup head square neck bolt DIN 603	Hexagon bolt EN ISO 4014/4017	Cup head square neck bolt DIN 603
Strength class	8.8	8.8	8.8	8.8
Type	M12 x 50	M12 x 50	M10 x 40	M10 x 50
Spring washer	DIN 6796	DIN 6796	DIN 6796	DIN 6796
Hexagon nut	EN ISO 4032	EN ISO 4032	-	EN ISO 4032

Connection dimensions for cable connection

Cable connection at the bottom



Cable connection at the top



Switch	Rated current [A]	D1	D2	D3	H1	H2	H3
3VA15	1 000	120	90	-	430	40	-
3VA25	1 000	120	90	-	430	40	-
3VA26	1 250	84.5	72.5	87.5	400	40	50
3VA27	1 600	88.5	85.5	95.5	400	40	50

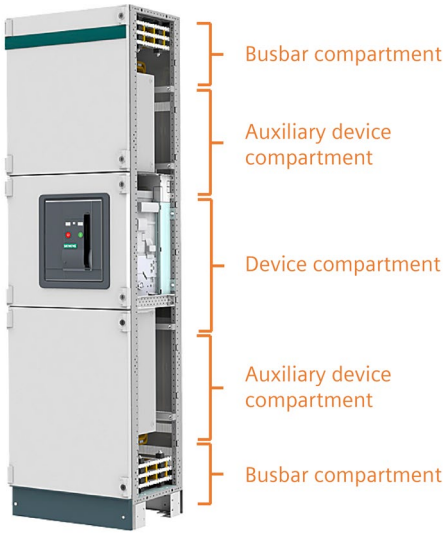
Insulation measures

Additional documentation

8PQ9803-2AA22	Switch insulation instruction
8PQ9801-5AA80	Operation and maintenance

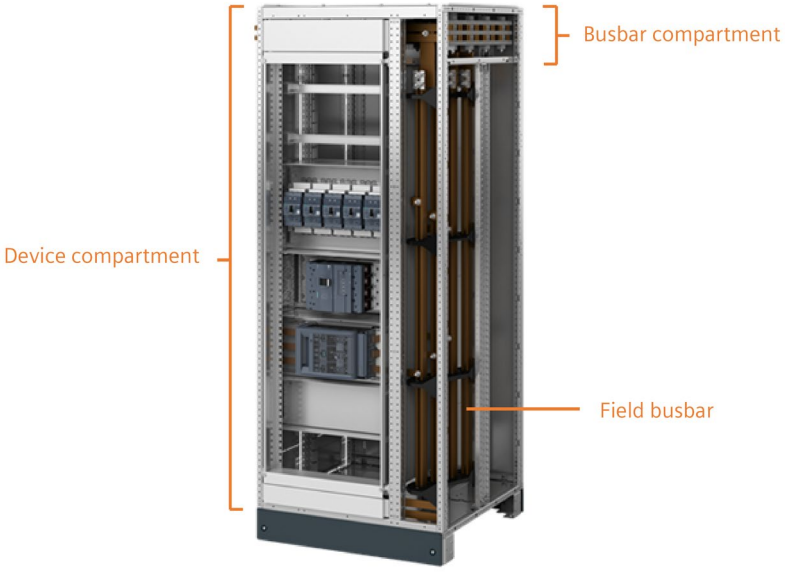
5.3 Coupling cubicle ACB

Cubicle design

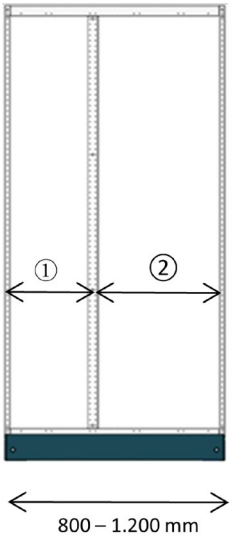


5.4 Outgoing feeder cubicle fixed-mounted version

Cubicle design



Formation of functional compartments

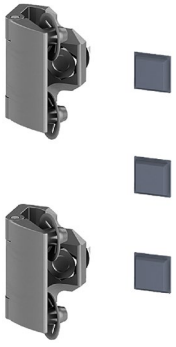


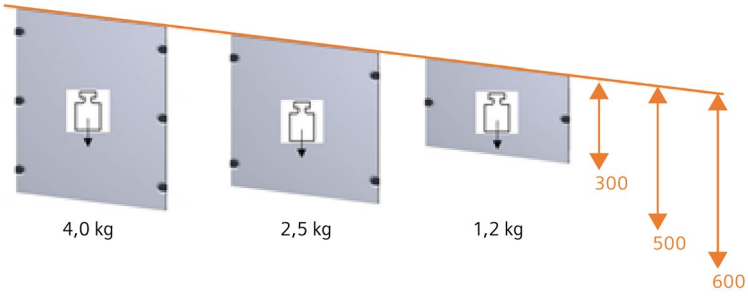
①Distribution busbar
System widths
200 mm
400 mm
Distribution busbar systems
Cascaded
Non-cascaded

②Device compartment
System widths
600 mm
800 mm
Assembly kits
3WA ACB
3VA MCCB
3NP1 fuse switch disconnector
3NJ4 fuse switch disconnector
Modular installation devices
Modular mounting plates

Trim hinge

8PQ2000-0BA08

	Cover height [mm]	Fitting weight [kg]	Number of hinges [quantity]
	**150 - 300**	1.2	**2**
	350 - 500	2.5	**2**
	550 - 600	4.0	**2 – 3**
	650	4.5	**2 – 3**
	800	5.5	**2 – 3**



Typical outgoing feeder cubicle with 3VA molded case circuit breaker



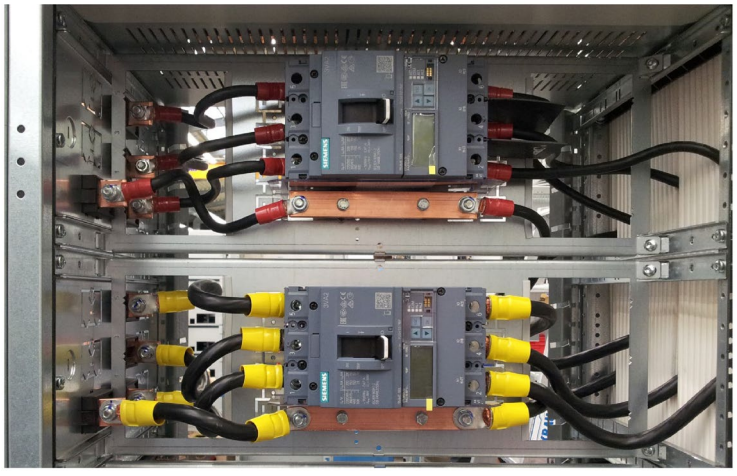
Front view



Rear view

Cable connection to 225 A

Rated current I_n **A**	 Cable cross-sections (stranded) **mm²**
8	1
12	1.5
20	2.5
25	4
32	6
50	10
65	16
85	25
115	35
150	50
175	70 or 2 x 35
225	95 or 2 x 50

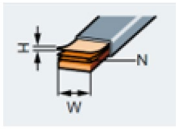


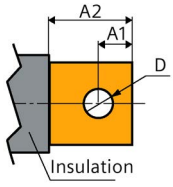
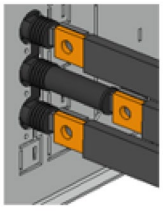
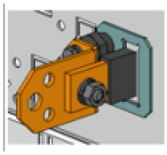
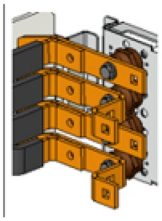
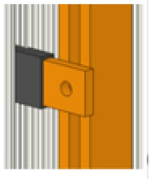
Cable connections in the compartment in form 3B with cable connection terminal



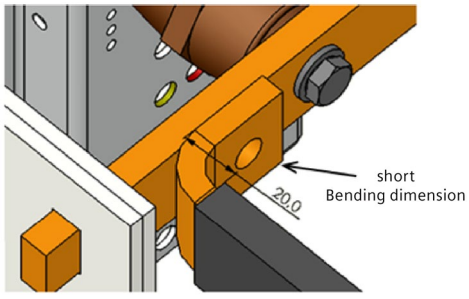
Connection to vertical busbar system

Connection to 630 A with flexible busbars

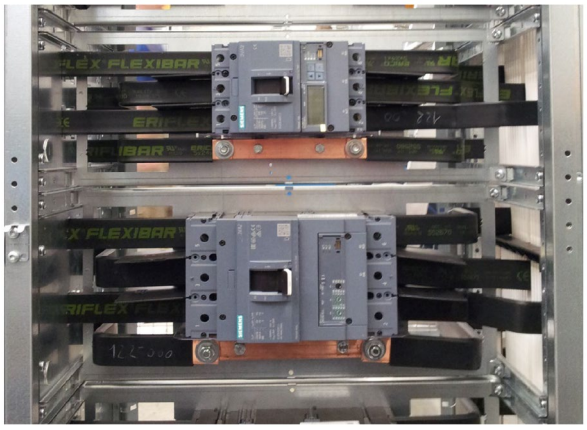
Rated current I_n	 **Flexible busbar**	
A	mm²	N x H x W in mm
250	120	5 x 24 x 1
400	256	8 x 32 x 1
630	256	8 x 32 x 1

Connection dimensions for flexible busbar						
		Device connection		Customer connection		
Switch	Dimension 	Flat connector 	Rear terminal 	Front connection 	Rear terminal 	Vertical busbar connection (cascaded) 
3VA12	A1	10.0	12.0	10.0	15.0	18.0
	A2	20.0	30.0	30.0	①	40.0
	D	8.5	10.0	8.5	8.5	10.5
3VA22	A1	10.0	12.0	10.0	15.0	18.0
	A2	20.0	30.0	30.0	①	40.0
	D	8.5	10.0	8.5	8.5	10.5
3VA13, -14 3VA23, -24	A1	14.5	17.0	10.0	13.5	18.0
	A2	29.5	35.0	30.0	①	40.0
	D	10.5	12.5	8.5	10.5	10.5

① Insulation with short bending dimensions



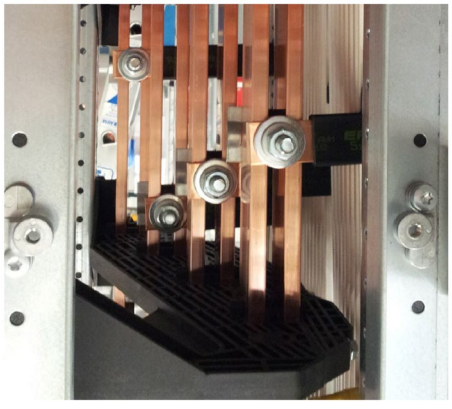
Connection: Distribution busbar cascaded



Connections in the compartment in form 3B with terminals



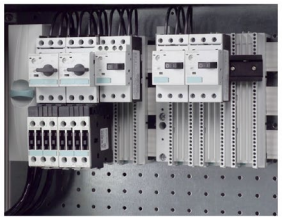
Customer connections



Connection to distribution busbar

Modular mounting plates

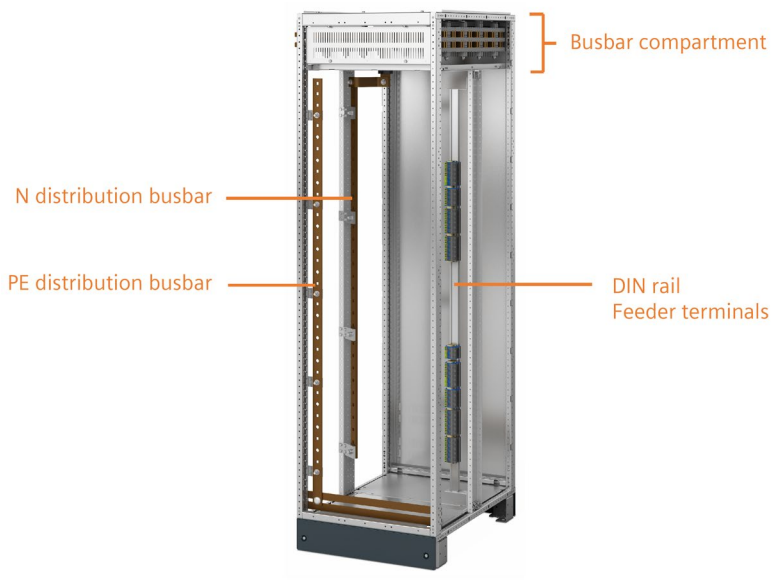
The installation of control technology is carried out by means of modular depth-adjustable mounting plates. Example applications: SIRIUS motor starter, SIMATIC controllers, SITOP transformers.





5.5 Cable panel

Cubicle design

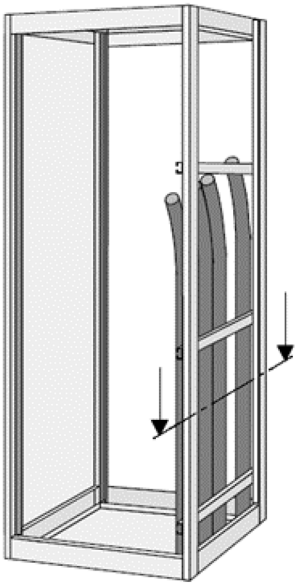


Cable fixing with C-type mounting bar

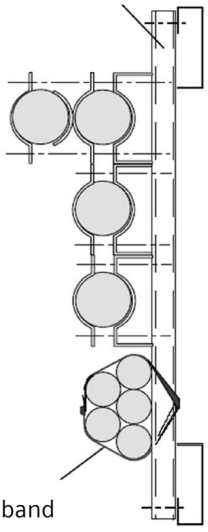
If necessary, single-core cables must also be tied together with cable tape between the cable brackets [L1, L2, L3, (N)].

Cable clamps for single-core cables must be made from magnetizable material.

When fastening, shaping and cutting the cables to length, care must be taken to avoid unnecessary tensile or shear forces on the connection points.



C-type mounting bar



5.6 Mounting plate field

Cubicle design

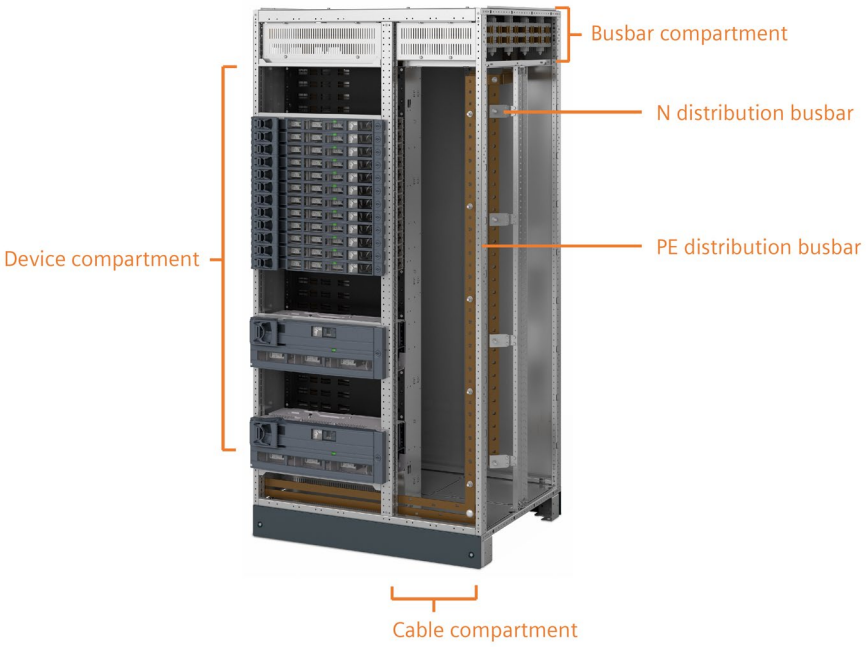


Static loads

Functional unit	Variant	kg
Cubicle equipment	Inner door Mounting plate	2.5 20.0
Cubicle door	Widths 400 ... 600 mm 800 mm wide 1000 mm wide	10.0 5.0 2.5
Double door	Widths 1000 ... 1200 mm	2.5

5.7 Outgoing feeder cubicle 3NJ6

Cubicle design



Configuration rule

Failure to comply with these instructions may lead to premature aging of fuses and uncontrolled tripping as a result of local overheating. All data refers to an ambient temperature of the switchboard of 35°C (24-hour average value).

Conversion factors for other ambient temperatures

Ambient temperature [°C]	20 °C	25	30	**35**	40	45	50	55
Conversion factor	1.1	1.07	1.04	**1.0**	0.95	0.9	0.85	0.8

Equipment rule: Total current of all feeders in the cubicle ≤ 2 000 A

Rated operational current I_{nc}	Size 00 / 1 / 2: I_N x 0.8 Size 3: I_N x 0.715
Rail arrangement:	Equipment in the cubicle, from top to bottom, decreasing from size 3 to size 00

	Continuous operating current at 35 °C	**Required blanking covers** **Type:** 3NJ6900-4CB00	
Size 3	≥ 440 A to 450 A of the individual device	top: 2 x 50 mm bottom: 2 x 50 mm 1)	 e.g., I_N = 630 A 630 A x 0.715 = 450 A = permissible continuous operating current
	< 440 A of the individual device	top: 1 x 50 mm bottom: 2 x 50 mm 1)	 e.g., I_N = 500 A 500 A x 0.8 = 400 A = permissible continuous operating current

Size 2	≤ 320 A of the individual device	top: - bottom: 1 x 50 mm 1)	 e.g,. I_N = 355 A 355 A x 0.8 = 284 A = permissible continuous operating current
Sizes 00 and 1 (Forming groups possible)	≤ 400 A = total current of the fuse links group x 0.8	top: - bottom: 2 x 50 mm per group 1)	 (∑ I_N) x 0.8 ≤ 400 A z. B. I_{N1} = 80 A, I_{N2} = 125 A, I_{N3} = 125 A, I_{N4} = 160 A (80 A + 125 A + 125 A + 160 A) x 0.8 ≤ 400 A 392 ≤ 400 A = permissible continuous operating current

1) Below the last rail in the cubicle there are only 50 mm blanking covers instead of 100 mm blanking covers or none required instead of 50 mm blanking cover. Blanking covers of adjacent rails are added up, each cover is only taken into account for the rail assigned to it.

Field busbar

The plug-in busbar system with line conductors L1, L2, L3 is located at the back of the cubicle. IP20 degree of protection is achieved by the optional touch protection with tap-off openings and the rails can be replaced under operating conditions.

Rated current

	Rated current for different ambient temperatures [A]						
Cross-section [mm]	20 °C	25 °C	30 °C	**35 °C**	40 °C	45 °C	50 °C
60 x 10	1680	1640	1 600	**1 560**	1520	1480	1430
80 x 10	2 260	2210	2155	**2 100**	2045	1985	1925

Short-circuit strength

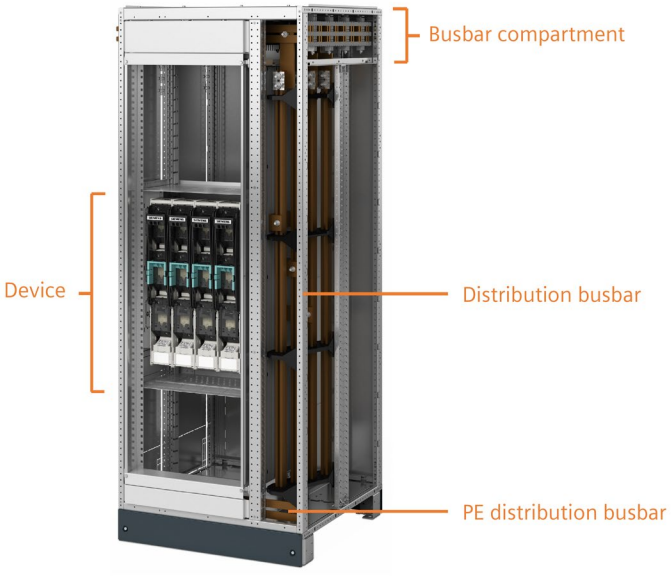
I_{pk} = 105 kA

I_{cw} = 50 kA, 1 s *

* rated conditional short-circuit current I_{cc} = 100 kA

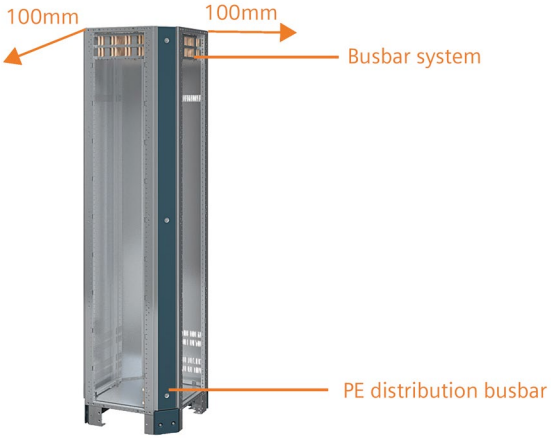
5.8 Outgoing feeder cubicle 3NJ4

Cubicle design



5.9 Corner cubicle

Cubicle design

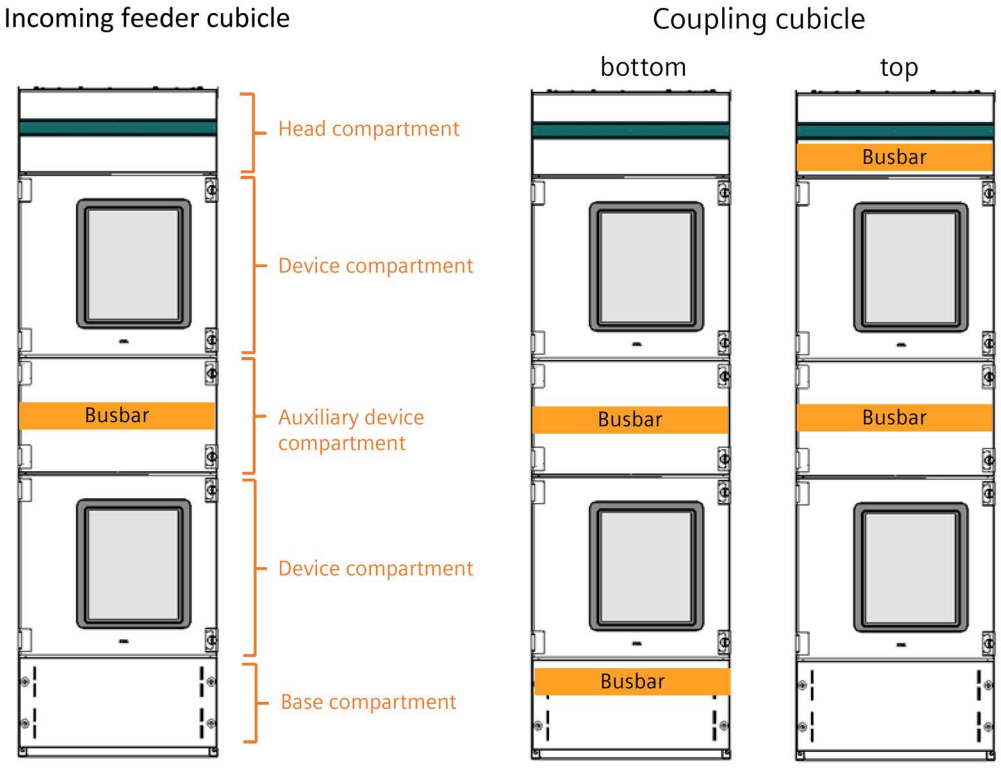


Main busbar rear

6

6.1 Incoming feeder or coupling cubicle ACB

Cubicle design



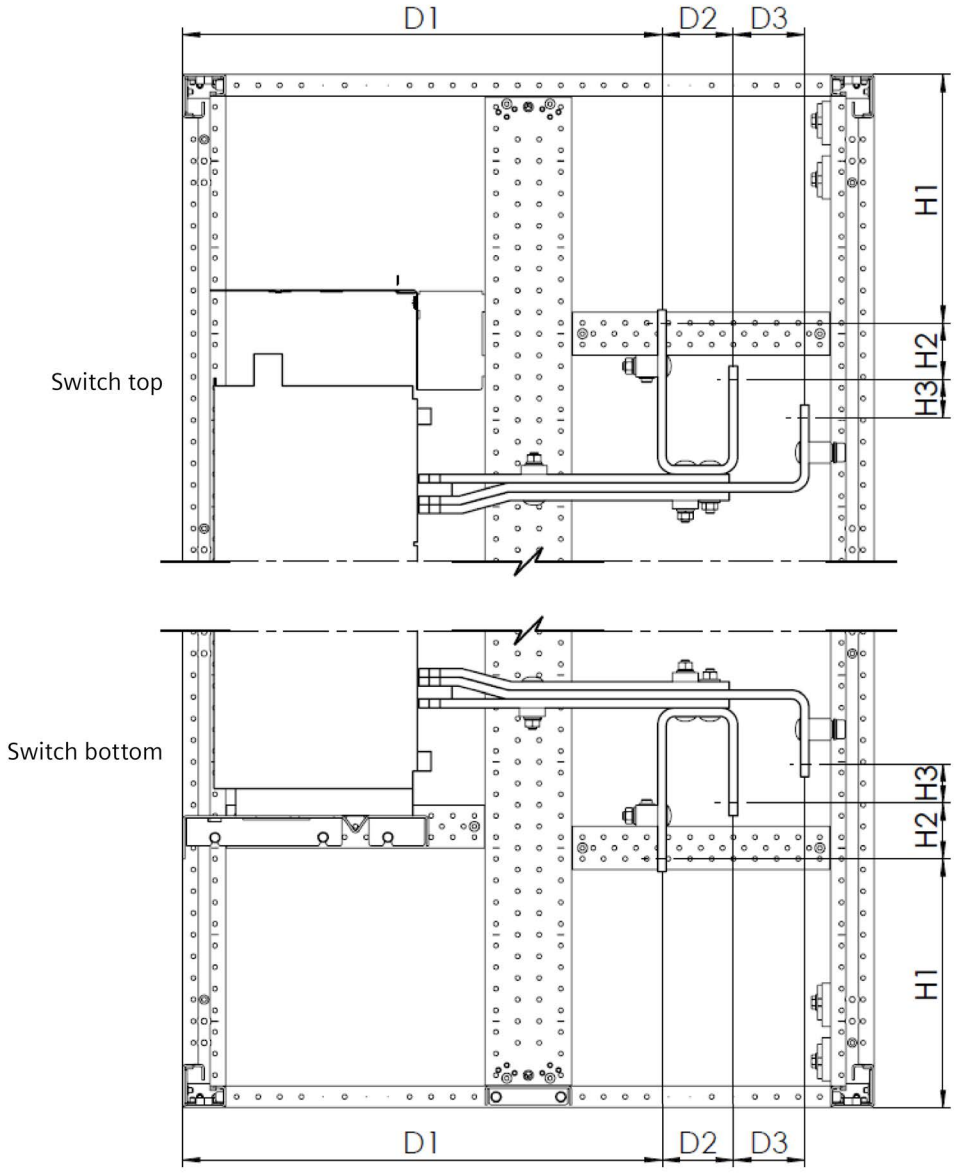
Connection:

	Cable lug DIN 46235 ≤ 240 mm² M12

Maximum number of cables that can be connected per phase:

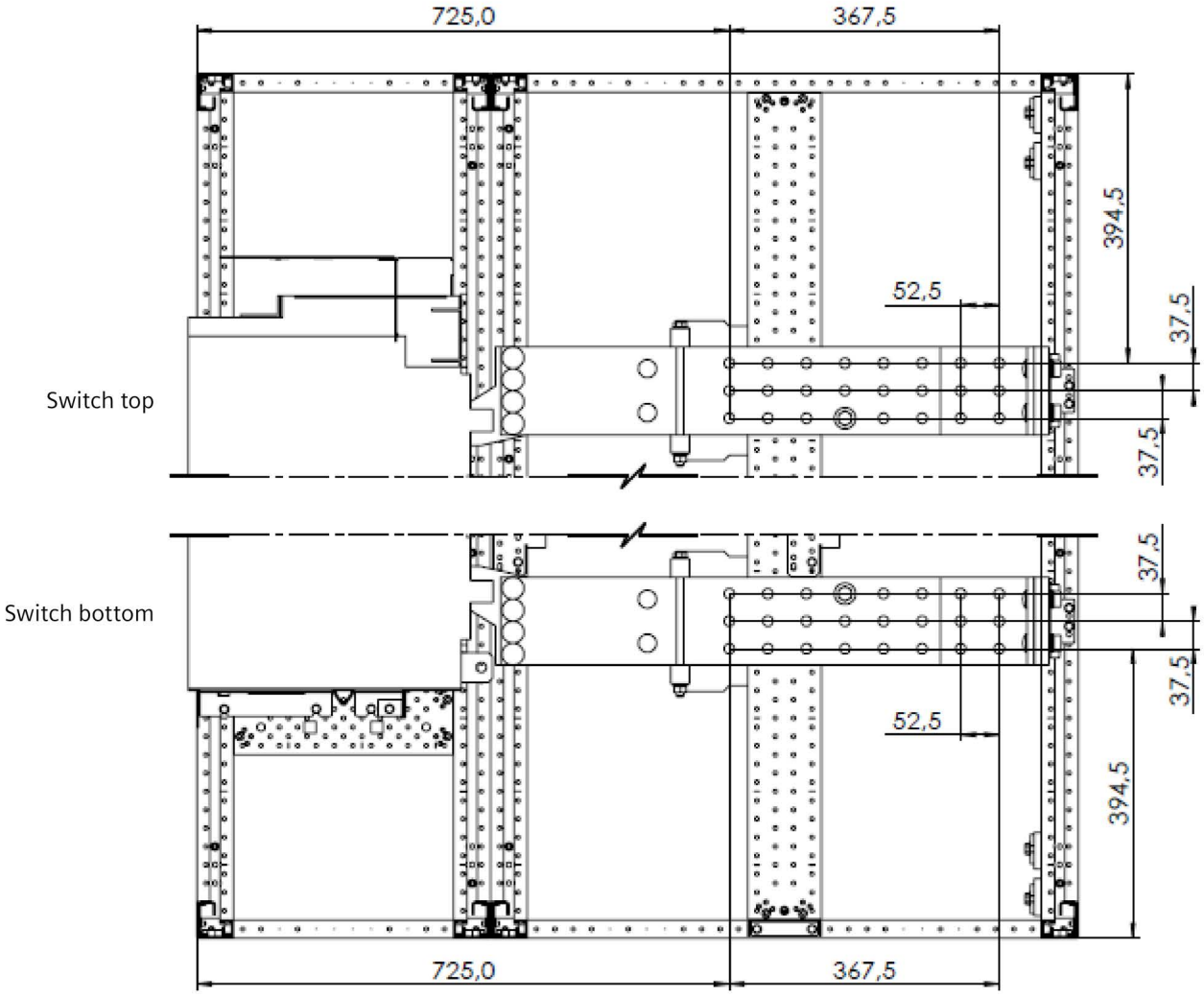
Size 1		Size 2	Size 3		
Up to 1 000 A	1 250 – 2 000 A	2 500 – 3 200 A	Up to 4 000 A	Up to 5 000 A	Up to 6 300 A
4	6	12	14	24	28

Connection dimensions sizes 1 and 2



Size	Rated current [A]	D1 [mm]	D2 [mm]	D3 [mm]	H1 [mm]	H2 [mm]	H3 [mm]
1	630 800 1 000	555	165	---	352.5	70	---
	1 250 1 600	555	82.5	82.5	352.5	35	35
	2 000	555	82.5	82.5	342.5	35	45
2	2 500 3 200	555	82.5	82.5	287.5	65	45

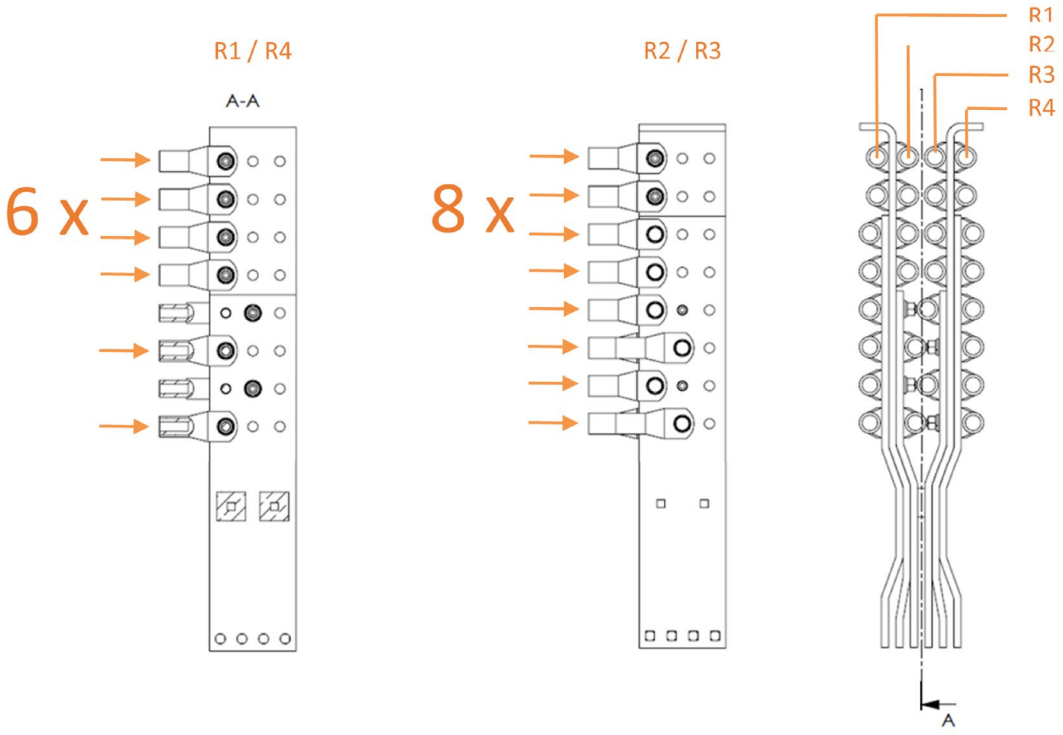
Connection dimensions size 3



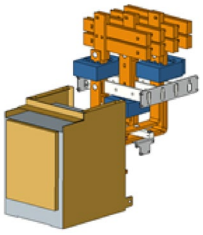
Cable connection 3WA size 3, IN = 6 300 A

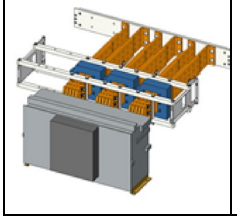
Arrangement of 28 cable lugs per phase L / N for cables up to 240 mm².

Representation of cable connection from above:



Installation of transformer

Busbar connection	Size	Switch	Rated current [A]	Type Supplier: MBS AG
	1	3WA1106	630	ASK 561.4
		3WA1108	800	ASK 561.4
		3WA1110	1 000	ASK 561.4
		3WA1112	1 250	ASK 561.4
		3WA1116	1 600	ASK 63.6
		3WA1120	2 000	ASK 105.6
	2	3WA1225	2500	ASK 105.6
		3WA1232	3200	ASK 105.6

Cable connection	Size	Switch	Rated current [A]	Type Supplier: MBS AG
	3	3WA1340	4 000	ASK 127.6
		3WA1350	5 000	ASK 127.6
		3WA1363	6 300	ASK 127.6

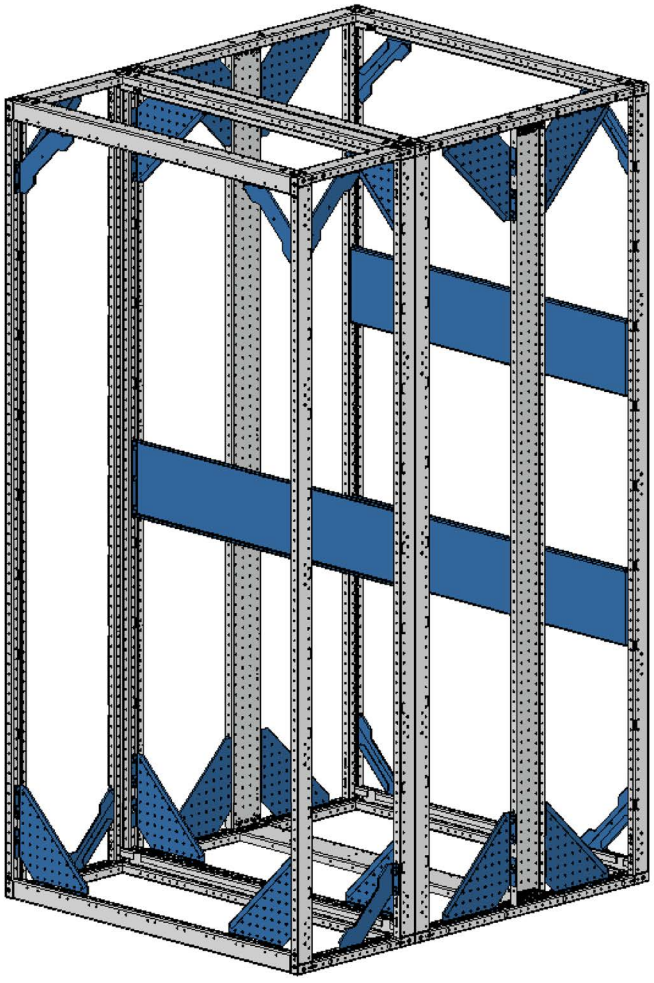
Mounting

Fixed-mounted circuit breakers or guide frames cannot be installed or removed later in the plant network.

Mounting sequence 3WA size 3

Note

Due to the high installation weights, bracing elements are required. These must be installed before the remaining cubicle equipment.



Maximum cubicle weight [kg]

Basis for determining weight:

1x function coupling + 1x function infeed / outgoing feeder, largest MBB,

4-pole version, without 3WA, without auxiliary devices, without other accessories

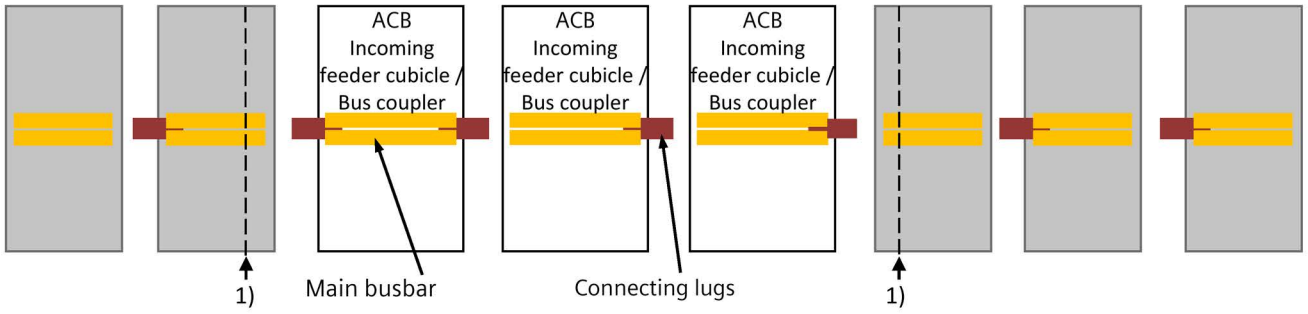
Feeders cubicle	Depth of cubicle [mm]					
	800		1 000		1 200	
	Fixed mounting	Withdrawable unit	Fixed mounting	Withdrawable unit	Fixed mounting	Withdrawable unit
2x 3WA1120	415	390	455	430	670	645
2x 3WA1232	580	540	620	580	930	890
2x 3WA1363	---	---	---	---	---	1950

Restrictions main busbar assembly incoming feeder cubicle / transversal coupler with 3WA13

The reason for this is the inaccessibility of the bolted connections of the connecting lugs in these fields.

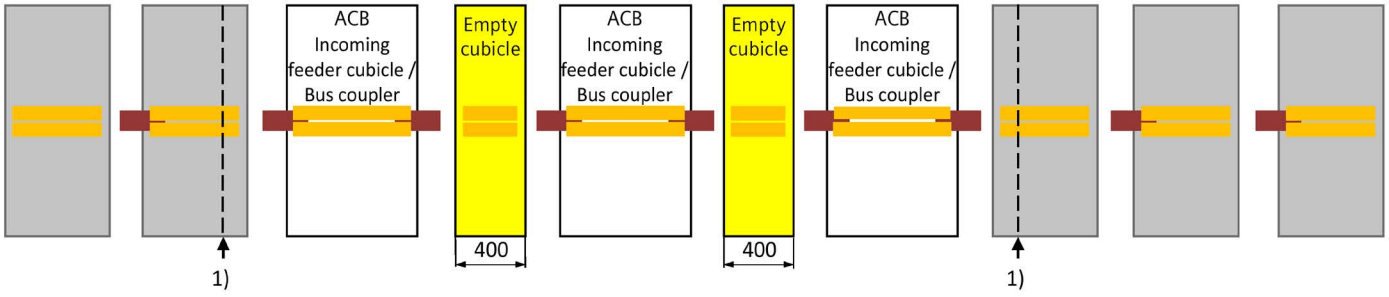
Solutions for mounting the main busbar assembly connecting lugs:

3-pole main busbar (L1, L2, L3, PE) with directly adjacent ACB cubicles with 3WA13



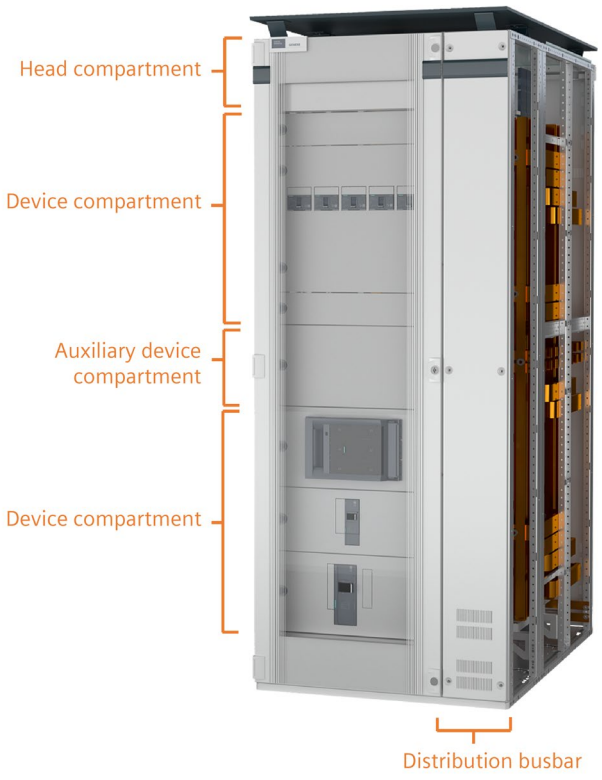
4-pole main busbar (L1, L2, L3, PE, N or L1, L2, L3, PEN) with directly adjacent ACB cubicles with 3WA13.

A 400 mm wide empty cubicle must be planned between the ACB cubicles for the main busbar assembly:



1) MBB assembly not possible if a distribution busbar directly adjoins this point in the 200 mm wide compartment, therefore a 400 mm wide distribution busbar compartment should be planned.

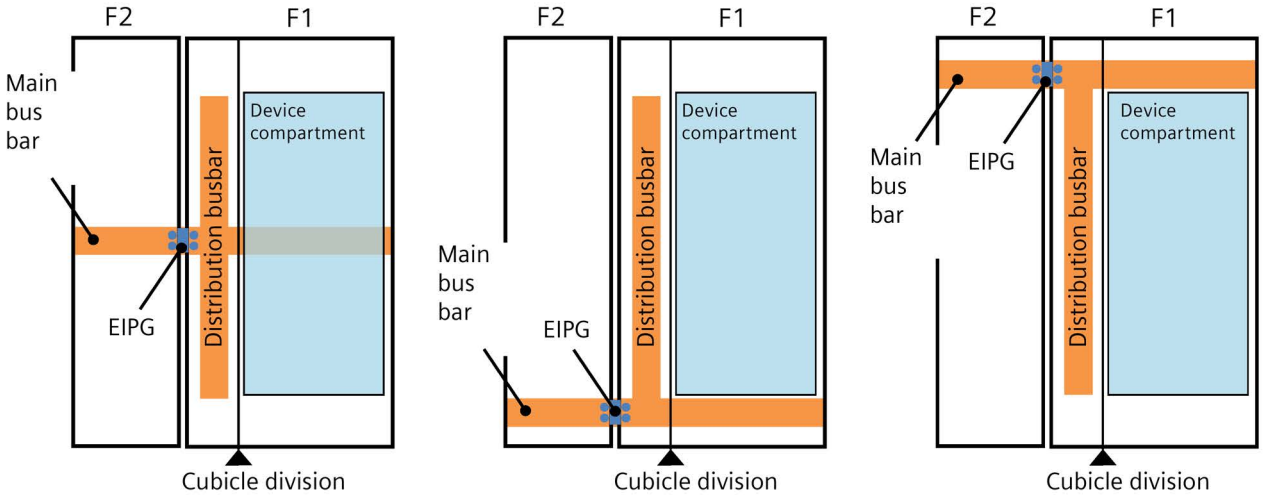
6.2 Outgoing feeder cubicle fixed-mounted version



Restrictions main busbar assembly for main busbar at back

Cubicle group with the help of connecting lugs not possible.

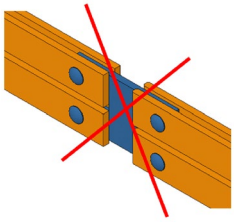
- Remedy: Use distribution bar cubicle with width of 400 or create a transport unit with continuous main busbar.



F1 Outgoing feeder cubicle with distribution busbar

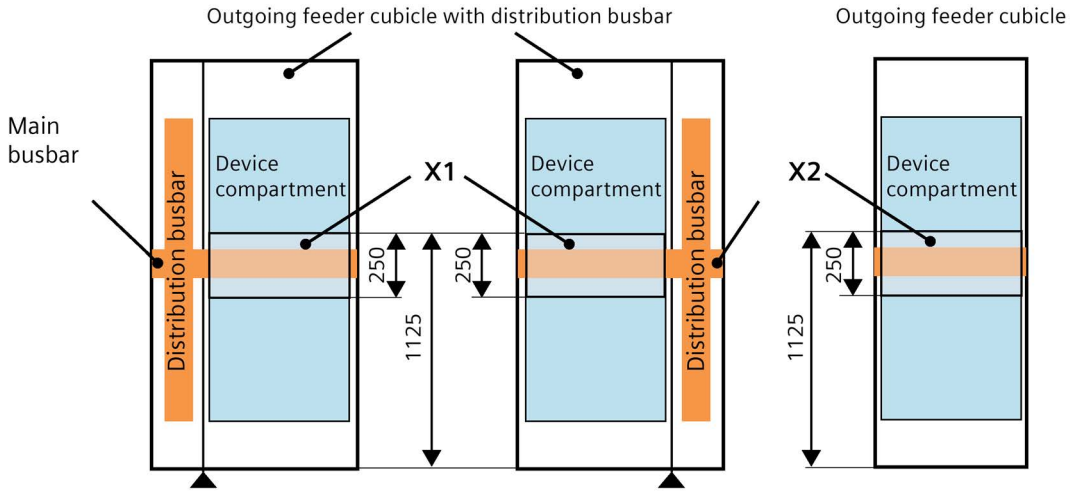
F2 Any adjacent cubicle

Power distribution board cubicle group with connecting lugs not possible!



Restriction in relation to equipment

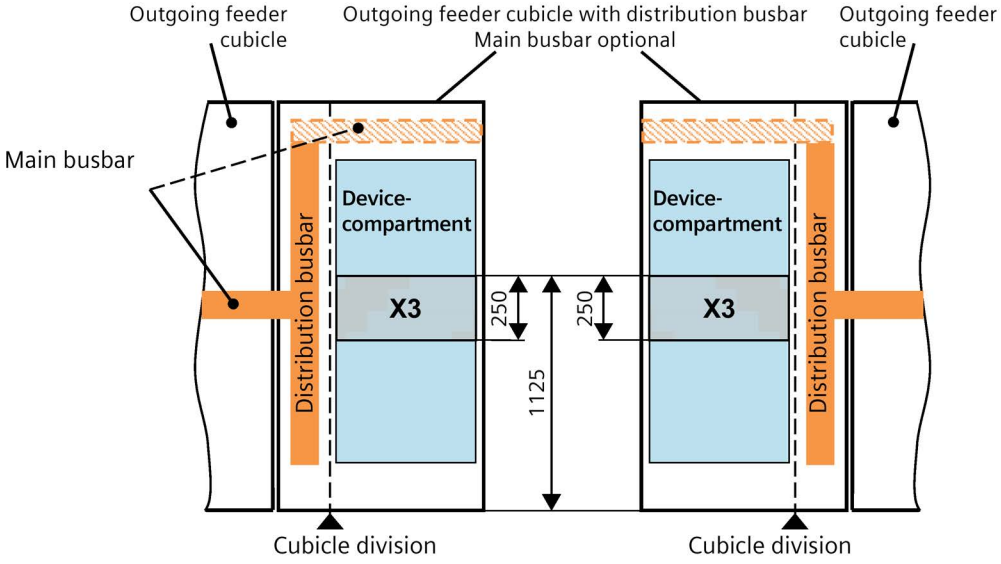
Individual cubicles

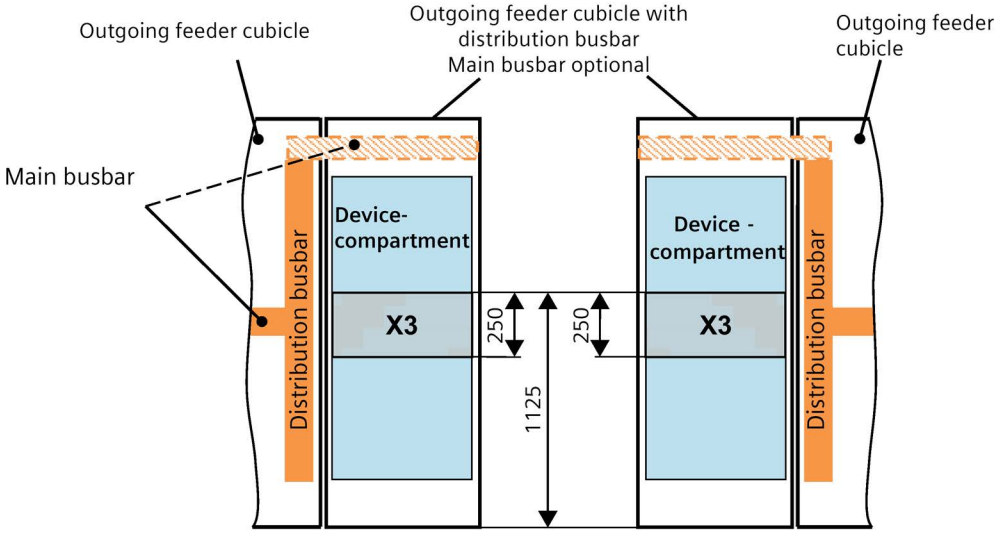


X1
- Restricted distribution bar connection
- The main busbar runs in depth 400, therefore no access from the rear is possible

X2
- The main busbar runs in depth 400, therefore no access from the rear is possible

Compartments in the plant network





X3 • Restricted distribution bar connection

6.3 PE cable connection

The cable connections are made with 8PQ4000-2BA58 profile brackets for NIEDAX cable U-clamps. Refer to the table for the number of cable and connection runs. Two parallel connection runs should be placed as close as possible.

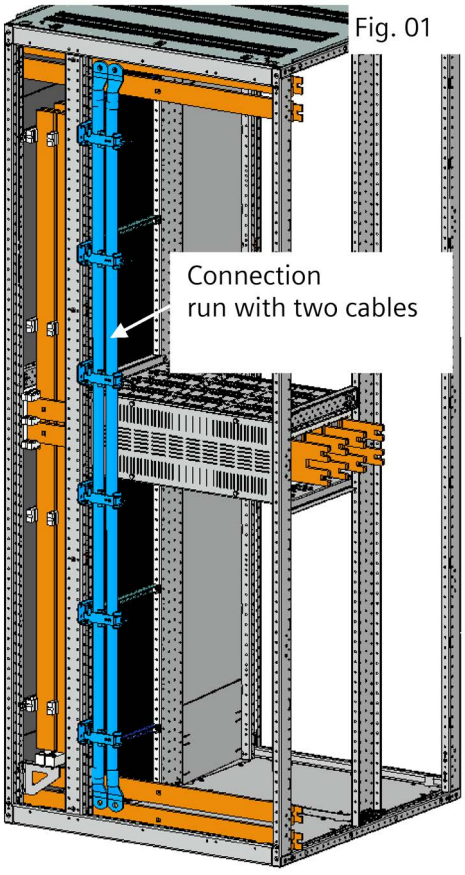
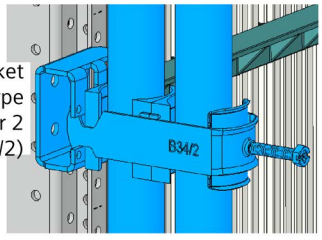
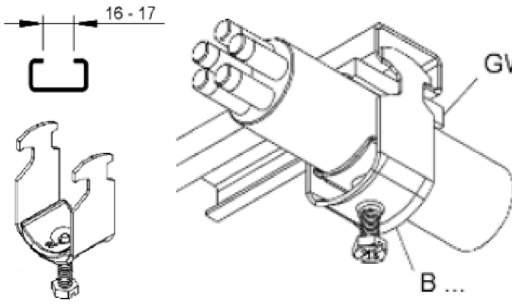


Fig. 01

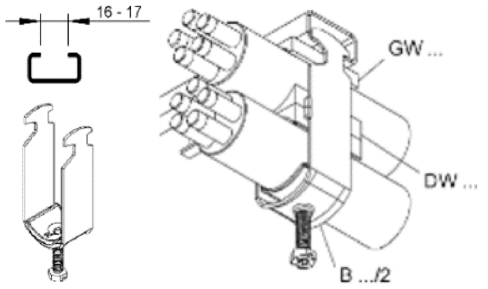


Profile bracket with clamp-type terminal for 2 cables (B ../2)

Type B clamp-type terminal for one cable



Type B clamp-type terminal for two cables



Required cable cross-sections for a PE connection

PE [mm] 	Short-circuit strength I_{cw} [KA]	Number of connecting cables [mm2]	Number of connection runs
2x 20x5	Up to 65	1x 240	1
2x 30x5	Up to 85	2x 150	1
2x 40x5	Up to 100	3x 150	2
2x 30x10	Up to 100	3x 240	2
2x 40x10	Up to 100	4x 240	2
2x 50x10	Up to 100	4x 240	2

Cable type: H07V-K (insulating material PVC)

Cable length: 1 825 mm per cable

Examples

PE busbar: 2x20x5 mm

PE connection from a connection run with a cable with cross-section 240 mm²

Outer cable diameter 24 mm (varies depending on the cable manufacturer)

Fixing accessories:	1x 8PQ4000-2BA58
	6 x hammer foot clamp-type terminals B 26 (single clamp)
	6x counter-troughs GW 26

PE busbar: 2x30x5 mm

PE connection from a connection run with two cables with cross-section 150 mm²

Outer cable diameter 19 mm (varies depending on the cable manufacturer)

Fixing accessories:	1x 8PQ4000-2BA58
	6x hammer foot clamp-type terminals B 22/2 (double clamp)
	6x counter-troughs GW 22
	6x double-troughs DW 20

PE busbar: 2x40x5 mm

Connection from two connection runs, 1 x two cables with cross-section 150 mm² and 1x cable with cross-section 150 mm²

Outer cable diameter 19 mm (varies depending on the cable manufacturer)

Fixing accessories:	2x 8PQ4000-2BA58
	6x hammer foot clamp-type terminals B 22/2 (double clamp)
	6x hammer foot clamp-type terminals B 22 (single clamp)
	12x counter-troughs GW 22
	6x double-troughs DW 20

PE busbar: 2x40x10 mm

Connection from two connection runs each with two cables with cross-section 240 mm² outer cable diameter 24 mm (varies depending on the cable manufacturer).

Fixing accessories:	2x 8PQ4000-2BA58
	12x hammer foot clamp-type terminals B 26/2 (double clamp)
	12x counter-troughs GW 26
	12x double-troughs DW 26

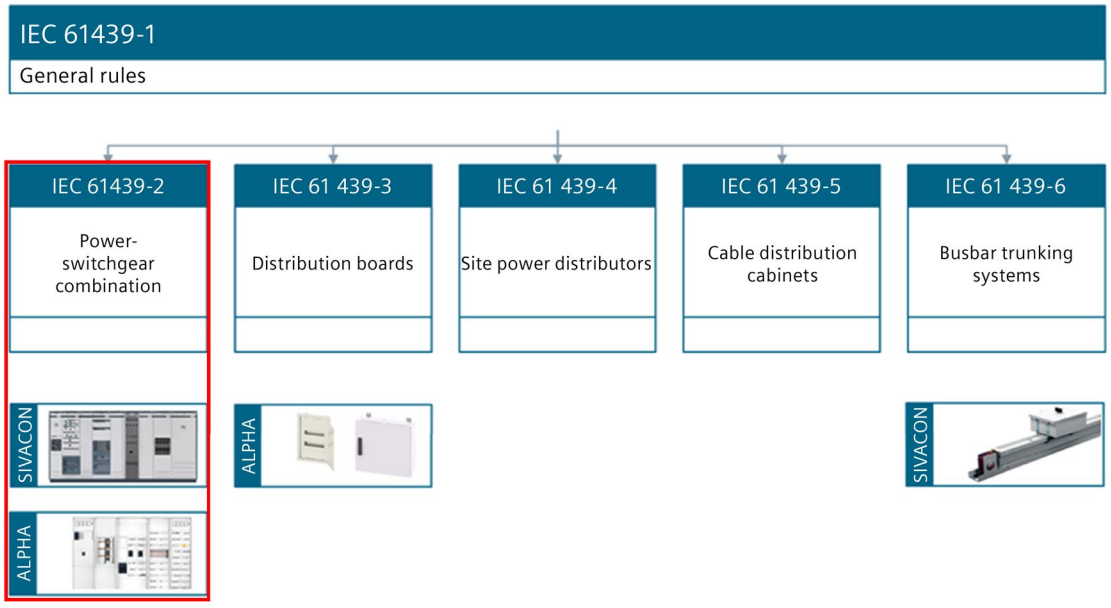
Hammer foot clamp-type terminals made from steel, hot-dip galvanized

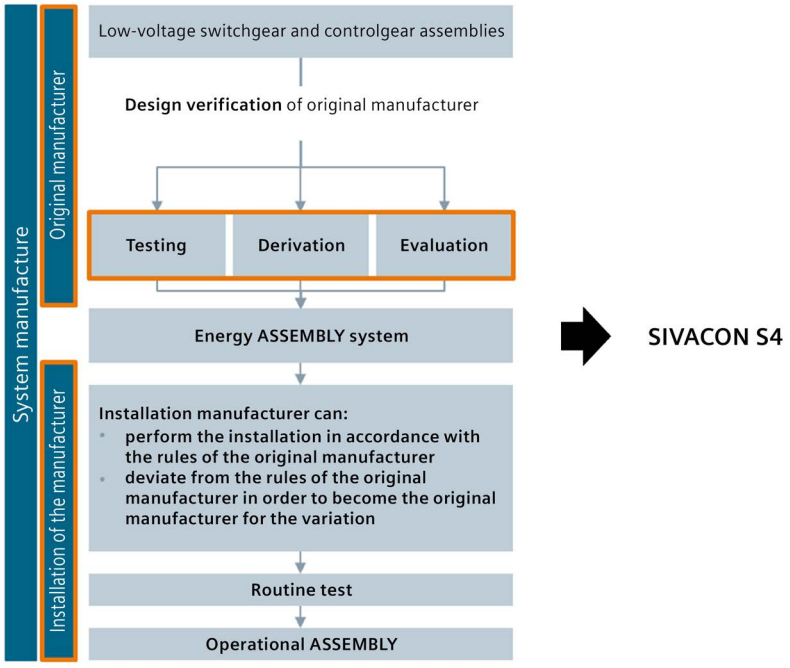
The incoming feeder cubicle ACB and coupling cubicle ACB are not suitable for installation.

Standards and specifications

7

7.1 Overview





NOTICE
In the case of modifications to the switchboard system, the installation manufacturer is responsible for the non-conformity of the adaptation.

7.2 CE marking

Low-voltage switchgear and controlgear assembly	IEC 61439-1/2 DIN EN 61439-1/2 VDE 0660 Part 600-1/2
Protection against electric shock	DIN EN 50274 VDE 0660 Part 514

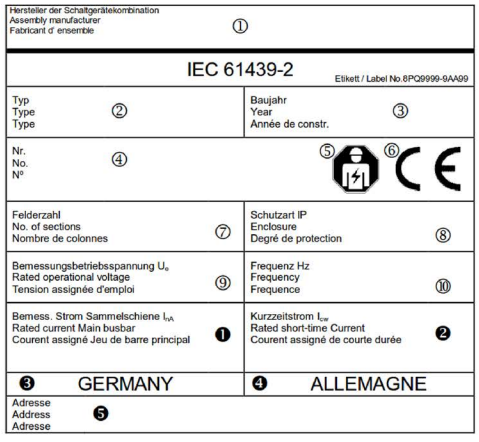
The manufacturer has sole responsibility for applying the CE marking. By affixing this, the manufacturer confirms that the products conform to the requirements set out in all the EU directives which govern the product.

Low-voltage switchgear and controlgear assemblies are subject to the Low-Voltage Directive and to the EMC Directive.

The marking is mandatory for any products being marketed throughout the entire European Union.

With the Declaration of Conformity, the manufacturer of the operational switchboard confirms compliance with the requirements in the directive or standard specified in the declaration.

Template for standard-compliant marking



① Manufacturer of switchgear and controlgear assembly (IEC 61439-1, para. 3.1.1)
② SIVACON S4 switchgear and controlgear assembly
③ Calendar year in which the system was manufactured, four-digit
④ System number
⑤ Symbol: Operation by skilled electricians
⑥ CE marking für manufacturer of the switchgear and controlgear assembly
⑦ Number of cubicles for which this rating plate applies
⑧ Degree of protection, e.g., IP41
⑨ Rated operational voltage Ue
⑩ Frequency in Hz
❶ Rated current busbar InA
❷ Short-time withstand current lcw
❸ Country of manufacturer, switchgear and controlgear assembly system
❹ Country of manufacturer, switchgear and controlgear assembly system
❺ Address

7.3 Routine test report

Manufacturers of operational switchgear and controlgear assemblies are obliged to maintain a routine test report in accordance with IEC 61439. Templates for this can be found in SIMARIS configuration.

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Protokoll für Stücknachweis (Stückprüfprotokoll)

☐ **Energie-Schaltgerätekombination**
Bauartnachweis nach DIN EN 61439-1/-2 (VDE 0660-600-1/-2)

☐ **Installationsverteiler**
Bauartnachweis nach DIN EN 61439-1/-3 (VDE 0660-600-1/-3)

Kunde:

Auftragsnummer:

Projekt:

Werkstatt:

Durchgeführte Nachweise:

Lfd. Nr.	Prüfart	Inhalt der Prüfung	VDE 0660-600-1 Abschnitt	Ergebnis der Prüfung	Prüfer
1	S	Schutzart von Schränken/Gehäusen (Dichtungen, Abdeckungen)	11.2		
2	S/P	Luft- und Kriechstrecken	11.3		
3	S/P	Schutz gegen elektrischen Schlag und Durchgängigkeit der Schutzleiterkreise	11.4		
4	S	Einbau von Betriebsmitteln	11.5		
5	S/P	Innere elektrische Stromkreise und Verbindungen	11.6		
6	S	Anschlüsse für von außen eingeführte Leiter	11.7		
7	P	Mechanische Funktion (Betätigungselemente, Verriegelungen)	11.8		
8	P	Isolationseigenschaften	11.9		
		Eine Prüfung der betriebsfrequenten Isolationsfestigkeit muss an allen Stromkreisen übereinstimmend mit 10.9.2 für die Dauer von einer Sekunde durchgeführt werden. Die Prüfspannung für Schaltgerätekombinationen mit einer Bemessungsisolationsspannung zwischen 300-690 V beträgt 1.890 V AC. Die Prüfwerte für abweichende Bemessungsisolationsspannungen sind in Tabelle 8 der IEC 61439-1 zu finden.		Prüfspannungswert V AC	
		Alternativ gilt für Schaltgerätekombinationen mit einer Schutzeinrichtung in der Einspeisung und einem Bemessungsstrom bis 250 A: Messung des Isolationswiderstandes mit einem Isolationsmessgerät bei einer Spannung von mindestens 500 V DC. Die Prüfung ist bestanden, wenn der Isolationswiderstand mindestens 1.000 Ω / V beträgt.		Isolationswiderstand Ω/V	
9	P	Verdrahtung, Betriebsverhalten und Funktion	11.10		

S = Sichtprüfung
P = Prüfung mit mechanischen oder elektrischen Prüfgeräten

Monteur: ..... Prüfer: .....

Datum: ..... Datum: .....

Technische Änderungen vorbehalten • Stand: Juni 2015

SIEMENS

Checkliste zum Konformitätsbewertungsverfahren

Firma: _____

Auftrag: _____

Projekt: _____

Typ: _____

Stempel

Niederspannungs-Schaltgerätekombination oder Verteiler	
☐	Energie-Schaltgerätekombination nach DIN EN 61439-2 (VDE 0660-600-2)
☐	Installationsverteiler für die Bedienung durch Laien nach DIN EN 61439-3 (VDE 0660-600-3)
☐	Installationskleinverteiler und Zählerplätze AC 400 V nach DIN VDE 0603-1
☐	.....
☐	**1. Technische Unterlagen**
Geltungsbereich der Niederspannungsrichtlinie 2006/95/EG	
☐	Listen oder andere Dokumentationen des ursprünglichen Herstellers für Niederspannungs-Schaltgerätekombinationen oder Verteiler (Wichtiger Inhalt: Name und Anschrift des ursprünglichen Herstellers sowie Typenbezeichnung, zutreffende Norm, Beschreibung des Erzeugnisses)
☐	Montage- und Installationshinweise des ursprünglichen Herstellers
☐	Schaltplan, Aufbauzeichnung, Stückliste
☐	Durchführung des Stücknachweises nach DIN EN 61439-1 / VDE 0660-600-1. Prüfprotokoll für Stücknachweis ist Bestandteil der Unterlagen
Geltungsbereich der EMV-Richtlinie 2004/108/EG	
☐	Ergänzung der technischen Unterlagen durch Herstellerunterlagen für alle elektronischen Einbaugeräte und Geräte, die Elektronik beinhalten (Montage- und Installationshinweise).
☐	Konformitätserklärung des Geräteherstellers, mit der die Übereinstimmung des Produkts mit den Anforderungen der EMV-Richtlinie bestätigt wird. Ein Hinweis in den Begleitunterlagen ist gleichwertig und entsprechend aufzubewahren.
☐	**2. Erstellen der Konformitätserklärung (siehe Seite 3)**
☐	**3. Anbringen der CE-Kennzeichnung (siehe Seite 3)**

Konformitätsbewertungsverfahren durchgeführt:

..... (Ort, Datum der Ausstellung)

..... (Name und Unterschrift oder gleichwertige Kennzeichnung des Befugten)

2 Technische Änderungen vorbehalten • Stand: Juni 2015

SIEMENS

Declaration of conformity

We,
(address)

Stamp

declare on our sole responsibility that the product

- ☐ Meter panels
- ☐ Small distribution boards
- ☐ Power switchgear and controlgear assembly
- ☐ Distribution board for the operation by non-experts

Designation, type, catalog or order no.:

.....

to which this declaration refers, conforms to and has been built according to the following standard(s).

Low-voltage switchgear and controlgear assembly or distributor	
☐	Power switchgear and controlgear assembly according to EN 61439-2 (VDE 0660-600-2)
☐	Distribution board for the operation by non-experts according to EN 61439-3 (VDE 0660-600-3)
☐	Small distribution boards and meter panels 400 V AC according to DIN VDE 0603-1
☐	.....
The specified product thus conforms to the standards of the following European directives:	
Low Voltage Directive 2006/95/EC	
☐	EMC directive 2004/108/EC (e.g. for electronic equipment, installed in a controlgear assembly or distributor according to the series EN 61439-1 (VDE 0660-600)

Affixing the CE marking*): ..... (Date) .....

....

(Place, date of issue) (Name and signature or equivalent identification of the party involved)

With this declaration of conformity, the manufacturer affirms compliance with the specified directives and standards.

This declaration of conformity corresponds to EN 17050-1 "General requirements for suppliers' declarations of conformity."
*) Visibly displayed in combination with manufacturer's identification on the low-voltage switchgear and controlgear assembly or on the distributor, also possibly only legible upon opening the door.

Subject to technical changes without notice • Version: June 2015 3

Notes

8

8.1 Legal information

Errors excepted and subject to change without prior notice. The information provided in this document contains merely general, not full descriptions or characteristics of performance which in case of actual use do not always apply as described or conclusively, are for general informational purposes or which may change as a result of further development of the products.

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8.2 Cybersecurity information

Siemens provides products and solutions with industrial cybersecurity functions that support the secure operation of plants, systems, machines and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial cybersecurity concept. Siemens' products and solutions constitute one element of such a concept.

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